

SONORAN QUARTERLY

FOR MEMBERS AND FRIENDS OF THE DESERT BOTANICAL GARDEN PHOENIX, ARIZONA MARCH 2009, VOLUME 63, NO. 1



CONNECTIONS: PART II

IN THE PREVIOUS ISSUE OF *THE SONORAN QUARTERLY*, I SHARED WITH READERS MY BELIEF THAT FOUR EMERGING REALITIES WILL SHAPE THE GARDEN'S FUTURE...



...Space allowed for discussion of just the first—that the Garden does not exist in isolation, but, rather, is a vital part of the entire Arts and Culture sector in Phoenix. Following are three other trends that I believe will have a profound effect on the Garden's future.

New technologies will enable the Garden to better communicate with its members and audiences

I would never want the Garden to lose the individual relationships that we strive to cultivate with each of our members, and I do not want technology to ever replace the feeling members have of being part of the Garden family. But I do think it is important for us to get beyond the analog phone systems we currently use, and have free Wi-Fi access throughout the Garden grounds. Someday soon, I would like to offer you the choice of receiving *The Sonoran Quarterly* on-line, instead of in printed form, and I want to be able to email you at three o'clock some July afternoon to tell you that the Queen of the Night plant behind Webster Auditorium is going to bloom that evening. I also believe that technology offers the Garden the potential to accomplish its mission with regional and national audiences by providing virtual access to our exhibits, herbarium collection, and library holdings.

Phoenix is a multilingual and multicultural community

The Garden exists to serve everybody in our community, but not "everybody" is coming to the Garden. That is, not yet. We have made great strides,

such as offering the Desert Landscaper School in both English and Spanish, providing new bilingual signage along the *Plants and People of the Sonoran Desert Trail* and in the new Cactus and Succulent Galleries, and offering our new audio tours in five different languages. But there is still much to be done and, as leaders of the institution, it is our responsibility to assure that the Garden's staff, board, volunteers, and visitors reflect the rich mosaic of people who live in the greater Phoenix community.

Public transportation will become an essential part of our lives

I'm lucky. I can walk five minutes from my house, catch the bus, and be at McDowell Road and Galvin Parkway in less than thirty minutes. I have been doing just that since last summer and have saved gas, avoided the aggravation of driving through traffic jams, and said goodbye to the hassles of parking. Unfortunately, we don't yet have the mass transit infrastructure that makes taking the bus an option for most people; I hope that our community's leaders will provide all of us with better choices in the near future.

One promising development is the new light rail system that debuted in late December, 2008, with a station at the intersection of Washington and Priest. That still leaves a forty-five minute walk to the Garden. If there were a shuttle system that linked the light rail station to the Garden and Zoo, wouldn't that be a wise investment for everybody? I certainly think so.

Ken Schutz,
The Dr. William Huizingh Executive Director

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In Appreciation

Back Cover

Get your Agave on the Rocks
tickets early and save \$10!

On our Cover

Dale Chihuly, *Scorpion Tails and
Bamboo*, 2008. Desert Botanical
Garden. Photo by Peter Brandeis

Chihuly: The Nature of Glass.

Now through May 31, 2009

Make your reservations at dbg.org
or 480-481-8188.

Spring Plant Sale

Members' Preview: March 20, 7 a.m. – 5 p.m.

Open to the Public: March 21, 7 a.m. – 5 p.m.
March 22, 9 a.m. – 5 p.m.



Here comes the CHIHULY SUN

During my eleven years at the Garden I have been involved with many exhibit installations, but nothing compares to the twelve exhilarating days of installing *Chihuly: The Nature of Glass*. After many months of planning and preparation for the installation, a big tent went up in the Garden's east parking lot—looking a lot like the circus had come to town.

The tent was so large I wondered if perhaps we had overestimated how much space we needed. Two days later the first tractor trailer truck pulled in to unload the first shipment of glass. As the tent quickly filled up, I had a brief moment of panic as the enormity of this installation began to sink in.

By the time the last truck (the fifth one) pulled away, the giant tent was bursting with 736 boxes, 783 tubes, 13 crates, and ten pallets holding the large armatures that support the chandeliers and towers. Opening each box of glass was a new discovery of color, light, and shape. Even after the 700th box, it was always magical and brought a smile.

**Chihuly re-awakens
our sense of what
we had become
inured to in nature.**

— Richard K. Nilsen
The Arizona Republic

by Elaine McGinn, Director of Planning and Exhibits



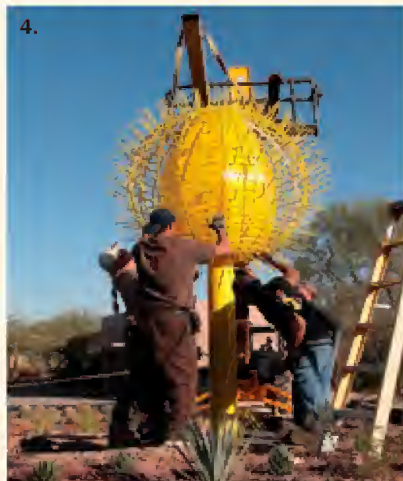
1.



2.



3.



4.



5.

Leading the Chihuly team and talking us through the installation was Tom Lind. His calm and quiet manner was reassuring. The nine members of the Chihuly team were an amazing group of installers who wasted no time in getting down to business. Additional installers included Garden staff from Exhibits and Facilities, as well as some very dedicated volunteers.

The Chihuly exhibition consists of 17 major pieces located throughout the Desert Botanical Garden.

This photo essay documents the installation of one of the major pieces of the exhibition, *The Sun*.

1. The big tent in the east parking lot was the main staging area for hundreds of boxes filled with glass.

2. *The Sun's* top armature was removed from the truck. It is a large yellow orb, referred to as a cage, from which spikes protrude to hold the glass. Weighing approximately 550 pounds, it was shipped on its own pallet. Our talented Facilities staff adeptly removes the armature from the truck with a fork lift. A total of three armatures support this magnificent tower.

3. *The Sun* is composed of more than 1,200 individual pieces of glass, which arrived in many boxes. Note all the 'FRAGILE' stickers!

4. Once on location in the Ottosen Entry Garden, a large fork lift was used to place the three armatures that support *The Sun*. Resting on a 665 pound base plate, the armature pole was added to provide height to the tower. The cage was then carefully centered and attached.

5. With the armatures in place, electric carts were used to move the 1,200 pieces of glass from the big tent to the site, one box at a time.



6. Each piece of glass, weighing ten to fifteen pounds, was laid out on blankets, inspected, and cleaned before being carefully handed to the installation crew.
7. Glass was first installed at the top and bottom of the sculpture to make sure it was a balanced sphere, and then the middle section was added. Plastic tubes were placed on the spikes of the armature. The glass was placed over the tubes, attached with wire and wrapped at the end of the glass.
8. It took six people five days to complete the incredible glass sculpture. Dale Chihuly's, *The Sun*, is magnificent in the Ottosen Entry Garden.

Other Installations:

9. The three glimmering *Desert Wildflower Towers* located at the entrance were designed specifically for the Garden.
10. *Float Boat*, one of the two signature Chihuly boats, rests in a desert wash.
11. The vibrant *Orange Hornet and Eelgrass Chandelier* is elegantly suspended from the center arch of the Sybil B. Harrington Succulent Gallery.



OTHER CHIHULY NEWS



Chihuly Gala Shines!

On November 21, 2008 the Garden welcomed 500 guests to the Opening Night Gala & Preview of *Chihuly: The Nature of Glass*. The Garden glowed as desert trails showcased Dale Chihuly's innovative and grand glass sculptures. Barbara and Donald Ottosen chaired the Gala, and Dale and Leslie Chihuly were honored guests. Blue Cross Blue Shield of Arizona was the generous presenting sponsor.

The Chairs received enthusiastic compliments following the event, including several guests who noted that "The Gala was the most incredible event I have ever attended."

Proceeds of the sold-out event, totaling more than \$319,000, were contributed to the Kresge Challenge, helping the *Tending the Garden* Campaign exceed its \$16 million goal.

WORKSHOPS

Taking Better Pictures: Intermediate to Advanced Photography Series with Steve Ehre

Thursdays / March 12, 19, 26, April 2 / 6:30-8:30 p.m.

Saturday / March 14 / 7:30 a.m.-5:30 p.m. / Tucson photo shoot
Saturday / March 21 / 7:30 a.m. / *Chihuly: The Nature of Glass* photo shoot

Member: \$140 / Non-Member: \$175

New! Chihuly Photography RSVP

Wednesday / March 18 OR April 1 OR April 15

7:30-9:30 p.m.

Sunday / March 22 OR April 5 OR April 19 / 7-9 a.m.

Member: \$16 / Non-Member: \$20

Night Photography-Capturing *Chihuly: The Nature of Glass*

Wednesday / March 18 / 6-10 p.m. OR

Tuesday / April 14 / 6-10 p.m. OR

Monday / May 4 / 6-10 p.m.

Member: \$32 / Non-Member: \$40

Children's Sculpture Workshop - Be Inspired by *Chihuly: The Nature of Glass*

Saturday / March 28 / 1-3 p.m. OR

Sunday / May 3 / 1-3 p.m.

Member: \$20 / Non-Member: \$25

Beyond the Basics--Photography in the Field with Adam Rodriguez

Sunday / March 29 / 6:30-10:30 a.m. OR

Sunday / April 5 / 6:30-10:30 a.m. OR

Sunday / April 12 / 6:30-10:30 a.m.

Member: \$80 / Non-Member: \$100

For more information and to register for classes visit dbg.org or call 480-481-8146.



Spiked! presents Chihuly Nights

Mix, mingle, and marvel at the Desert Botanical Garden's new Thursday night social event, featuring the incredible glass artwork of Dale Chihuly. Each evening will showcase a different Chihuly sculpture in one of our unique venues, paired with a Chihuly-inspired creative cocktail. *Spiked!* includes Garden admission, hors d'oeuvres prepared by Atlasta Catering, and entertainment. A cash bar will be available each evening. Guests must be 21 or older to attend and must show proper identification to be admitted. Limited parking is available; please carpool.

February 26	DJ World Famous Rani "g"
March 5	DJ World Famous Rani "g"
March 12	Black Carl
March 19	The Mikel and Meridith Band
April 2	What Laura Says (Thinks and Feels)
April 9	Strange Young Things
April 16	DJ World Famous Rani "g"
April 30	Dry River Yacht Club
May 7	Colorstore
May 14	DJ World Famous Rani "g"

Thursday Nights / 5:30-8 p.m. / \$25

To Purchase Tickets:

- Order online at dbg.org
- Call 480-481-8188, Monday - Friday (8 a.m.-4 p.m. daily)
- Visit the Admissions Box Office (8 a.m.-8 p.m. daily)



THE CONSERVATION OF DESERT PLANTS: What can genetics tell us?

Every day you and I enjoy the benefits of the biological diversity that surrounds us. The clothes we wear, food we eat, fuel we use, and beautiful landscapes we take pleasure in are all products of earth's biological diversity. Over the past 150 years, however, we have seen this diversity decrease at an alarming rate. Botanists estimate that up to 144,000 plant species, or 47% of the global flora, are threatened with extinction.

(Pitman & Jørgensen, 2002).

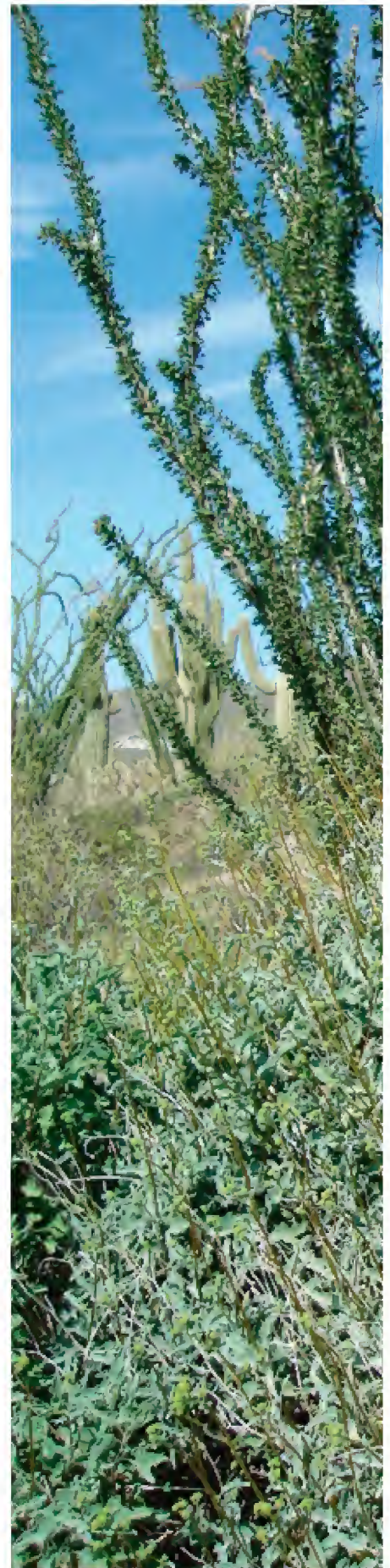
Protecting our remaining biological diversity is the central goal of conservation biology. Conservation biologists use the term *biological diversity*, or *biodiversity*, to mean the complete range of species and biological communities, the genetic variation found within species, and the sum of all ecosystem processes on earth (Primack, 2008). Research by conservation biologists provides decision-makers and society with the best information possible about the processes that create and sustain biodiversity. Although these scientists study various disciplines such as ecology, genetics, evolutionary biology, population biology, systematics (taxonomy), and applied resource management, they are united by the goal of providing the knowledge and tools required for the long-term preservation of biodiversity.

As the Dorrance Family Foundation Conservation Biologist at the Desert Botanical Garden, I am excited about the opportunity I have to contribute to these efforts. My research specialty is conservation genetics. Conservation genetics can provide important information about the current status of threatened plant populations as well as the factors that may have affected them in the past and may affect them in the future. Though I can't discuss all of the facets of conservation genetics here, I will highlight two examples that show the types of insights that can be gained through such studies.

In the early 1900s, the American chestnut (*Castanea dentata*) was one of the dominant trees in deciduous forests of the eastern United States. At that time, those forests contained an estimated four billion American chestnut trees. This tree species was a vital part of the forest ecosystem, providing a reliable food source for people as well as many kinds of animals. The rot-resistant lumber was highly prized and used for everything from the construction of homes and barns to fine furniture and musical instruments.

In 1904, a disease called chestnut blight was first noticed on American chestnut trees growing in New York City. Chestnut blight is caused by a fungus (*Cryphonectria parasitica*) that enters through the bark and spreads throughout the wood and vascular tissues, eventually cutting off the flow of nutrients thus killing the tree. The fungus was accidentally introduced from non-native chestnut trees imported from Asia; American chestnut trees possessed little or no natural resistance to this exotic fungus. Chestnut blight spread like wildfire, killing almost every native chestnut tree in the eastern U.S. by 1950. It is estimated that fewer than one hundred mature American chestnut trees survived in the native range. In some areas, the American chestnut survived only as sprouts from the roots of stricken trees. Today, very few of these sprouts are able to reach maturity, flower,

by Shannon Fehlberg, Ph.D., Dorrance Family Foundation Conservation Biologist





Knowledge of genetics can also help researchers at botanical gardens and arboreta capture the full range of genetic potential for *ex-situ* conservation, which involves the maintenance of living collections apart from their native environments.

and produce nuts (seeds).

What can be done to halt—and possibly reverse—the almost fatal decline of the American chestnut? Today, several conservation organizations are working to discover and develop blight-resistance, and restore these trees to their native range (the American Chestnut Foundation; www.acf.org). Conservation genetics plays a key role in this effort. One of the first steps is an investigation of the genetic makeup of the few surviving trees, and an evaluation of how this makeup varies from place to place. Knowledge of this genetic variation is important because it leads to an understanding of the ability of the few survivors to fight disease and react to new environmental challenges. Genetic information can lead to better decisions when managing existing populations (for example, identifying genetically unique populations) and choosing plants for breeding programs and reintroductions.

Knowledge of genetics can also help researchers at botanical gardens and arboreta capture the full range of genetic potential for *ex-situ* conservation, which involves the maintenance of living collections apart from their native environments. Recently, the effort to restore the American chestnut expanded to include genomics, the investigation of how specific characteristics like disease resistance are determined by genetic composition. This effort is similar to the way the Human Genome Project has contributed to our knowledge about the genetic basis of many human diseases.

The story of the American chestnut demonstrates how genetics can provide important information for the

restoration of threatened plants.

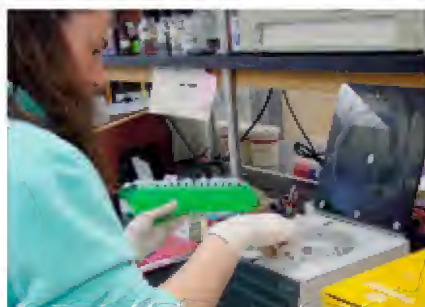
Genetics can also provide information about how certain events, which have occurred over long periods of geological time, have influenced the formation and distribution of plants that are now threatened. These genetic studies can help us identify biodiversity hotspots, which are geographic areas with high species diversity, high genetic variation, and large numbers of rare and endemic species. They can also shed light on how plant populations have responded to environmental changes over the past thousands of years, possibly providing insight into how populations will respond to future environmental changes.

The southwestern deserts of North America are an excellent location for genetic studies because the region's geological history is fairly well understood. For example, we know that large-scale geological events shaped the geography of the region over the last several million years. One such event was the formation of the Sea of Cortéz, which separated the state of Sonora, Mexico, from the Baja California peninsula (3 to 5 million years ago). Another event was the formation of the Isthmus of La Paz, which resulted from a temporary channel of water that separated the southernmost Cape Region from the rest of the Baja California peninsula (3 million years ago). These events, which isolated populations geographically, may have resulted in evolutionary changes that gave rise to new species.

Another source of knowledge about the region's geological history

comes from studies of plant fossils preserved in packrat middens (nests built by packrats; see *Sonoran Quarterly* Vol. 50 (3), p. 4-7, Sept. 1996). Such studies have provided evidence for geographical shifts in the distribution of desert vegetation in response to the coming and going of repeated ice ages. Analyses of midden fossils indicate that periods of ice age cooling increased the frequency of winter freezes and decreased summer precipitation in what are now desert regions. These major changes allowed the expansion of northern woodland vegetation into current desert regions, while desert vegetation was able to survive only much farther south. Such changes in plant distributions shuffle and sort the botanical occupants at any one place, and can contribute to evolutionary changes over time.

How has the unique history of southwestern deserts influenced biodiversity in this region? Can genetics help us discover biodiversity hotspots and possible links between geological events and increased diversity? I am working to address these types of questions with my own research on a variety of desert plants, including the desert shrub brittlebush (*Encelia farinosa*). Brittlebush is distributed throughout the region in the Sonoran Desert (southwestern Arizona, southeastern California, and much of the state of Sonora, Mexico), Mojave Desert (southeastern California, southern Nevada, and northwestern Arizona), and Peninsular Desert (Baja California Peninsula, Mexico). Studies of common plants such as brittlebush



can help us understand how certain events, which have occurred over long periods of geological time, have influenced the evolution and distribution of species in these areas.

In order to examine genetic variation in brittlebush I first collected leaf samples from fifteen individual plants from each of twenty-one populations distributed throughout the range. Back in the laboratory I extracted DNA from the leaves and selected a specific portion of the extracted DNA to study. I began the multi-step process of DNA sequencing with a copying method called polymerase chain reaction (PCR), during which I combined extracted DNA from each sample, short pieces of “starter” DNA called primers, and specific enzymes and salts, and repeatedly cycled this mixture through hot and cool temperatures. I then labeled the specific copied portion of DNA from each sample with fluorescent dyes and submitted it to a lab that uses specialized equipment to read the actual DNA sequence, or genetic code. After I received the results of the DNA sequencing, I compared

sequences among individual samples to look for similarities and differences.

The results of my analyses revealed some interesting patterns of genetic diversity in brittlebush populations. First, I discovered that a population from the Cape Region of southernmost Baja California, representing a variety of brittlebush called ‘radians’, carried a unique genetic code that differed from all other populations of brittlebush. Perhaps this variety, which is found only in that area, arose from other populations and varieties during the formation of the Isthmus of La Paz, when the Cape Region was separated from the rest of the Baja California peninsula.

Second, I found that all populations could be divided into three distinct genetic groups and that each genetic group had a distinct geographic distribution. These genetic groups may have arisen during periods of ice age cooling, when they were isolated in different refuges. Furthermore, some portions of the brittlebush range had populations with high levels of genetic variation, while other portions of the range had populations with very low levels of genetic variation. Those portions of the range with high levels of genetic variation could indicate areas where desert plants survived during periods of ice age cooling. In fact, at least five other similar studies, such as the study examining genetic variation in senita cactus (*Lophocereus*

schottii; Nason et al., 2002), identified these same areas as sites of increased diversity and as possible ice age refuges. These biodiversity hotspots are located near the lower Colorado River Basin in western Arizona, on the eastern plains of the state of Sonora, Mexico, and at the southern tip of the Baja California peninsula.

My study of brittlebush demonstrates that genetic data contribute to our knowledge of geological events and their influence on plant populations in particular geographic regions. The amount and distribution of genetic diversity I found in brittlebush populations indicates that geological events, which isolated populations, and climate change associated with periods of ice age cooling have affected plant populations in southwestern deserts. In addition, my research, as well as the research of others, provides evidence for the presence of biodiversity hotspots and helps us as we seek to understand the occurrence of rare and endemic plants in this region.

As I continue my research at the Desert Botanical Garden, I will use conservation genetics to learn more about the threatened plant populations that occur in our deserts. Together with conservation biologists worldwide, I will work to provide knowledge and tools for the long-term preservation of earth’s biodiversity.

References

- Betancourt, J. L., T. R. Van Devender, and P. S. Martin, eds., 1990. *Packrat Middens: The last 40,000 Years of Biotic Change*. University of Arizona Press, Tucson.
- Hafner, D. F. and B. R. Riddle, 2005. “Mammalian phylogeography and evolutionary history of northern Mexico’s deserts.” Pp. 225-245 in J. E. Cartron, G. Ceballos, and R. S. Felger, eds. *Biodiversity, Ecosystems, and Conservation in Northern Mexico*. University Press, Oxford.
- McAuliffe, J.R., 1996. “A celestial field experience: the comet, an eagle’s eye, and ancient middens.” *Sonoran Quarterly* 50(3): 4-7.
- Nason, J. D., J. L. Hamrick, and T. H. Fleming, 2002. “Historical vicariance and post-glacial colonization effects on the evolution of genetic structure in *Lophocereus*, a Sonoran Desert columnar cactus.” *Evolution* 56: 2214-2226.
- Primack, R. B., 2008. *A Primer of Conservation Biology*. Sinauer Associates, Inc. Sunderland, MA.
- Pitman, N. C. A and P. M. Jørgensen, 2002. “Estimating the size of the world’s threatened flora.” *Science* 298: 989.

AT HOME IN YOUR DESERT GARDEN

LIZARD TALES FROM THE GARDEN



A Desert Spiny Lizard stalks flies attracted to a carrion plant.

We may have to start marking time at the Garden as BC (before Chihuly) and AC (after Chihuly). Before Chihuly, for example, nothing grabbed the attention of our visitors faster than a large lizard scurrying across the path or doing push-ups on rock walls. Like little animated Chihuly creations, many of our lizards have bold patterns or brilliant colors that change with the sun's rays and, again like many Chihuly sculptures, they even have some detachable parts.

In contrast to the eight species of lizards supported by habitat at the Garden, many backyards in urban Phoenix provide habitat for only one or two species – the ubiquitous Ornate Tree Lizard that we see basking on our backyard cinderblock walls, and perhaps the non-native, nocturnal Mediterranean Gecko that we see stalking moths around our patio lights.

Visitors seldom see all of our lizard species. For instance, the native, cat-eyed, Western Banded Gecko, which stores fat in its bulbous tail, comes out only at night; the Side-blotched Lizard keeps a low

profile on the ground; and on the outskirts of the Garden the shy Desert Iguana climbs creosote bushes to eat the yellow flowers. However, on any warm day, you have an excellent chance of getting to know the three flashiest species of Garden lizards, whose antics might even temporarily distract you from our spectacular Chihuly eye-fest.

The stars of the show are the stout-bodied Desert Spiny Lizards, which can grow up to thirteen inches long. Males often perch on rocks doing push-ups to tell other male lizards to back off, and to attract females. Both sexes have black wedges on the shoulders; even the tiny hatchlings have this diagnostic mark. Like many lizards, they are darker in color on cool days, an adaptation for absorbing more of the sun's heat. The males have blue-green throat and belly patches.

They relish insects, but will eat anything they can capture and swallow. They can often be seen stalking the flies drawn to the distinctive odor of the

by Tom Gatz, Garden Docent and Horticulture Aide



In spite of being surrounded by a city, the Garden in Papago Park, like an island of natural habitat in an urban sea, continues to support a healthy diversity of fascinating lizard species.

Male and female Desert Spiny Lizards

carrión plant (*Stapelia*) when it's in flower. One warm Sunday afternoon on the Quail Run path, my Garden tour group watched with a mixture of horror and fascination as a big spiny lizard swallowed a smaller whiptail lizard headfirst.

Like most lizards, the spiny lizard will readily part with its tail in order to escape the clutches of a predator. The detached tail continues to wiggle, providing a diversion and fooling the predator into thinking it has made a successful capture. A new, but boneless, tail eventually grows back. One winter day, while removing plants from the old succulent house, we unearthed a hibernating spiny lizard, accidentally breaking off its tail. It was a cold morning and so neither the lizard nor its tail was moving. About an hour later, though, after being warmed in the sun, the detached tail began to wiggle!

Its long, whip-like tail best identifies the second most common Garden lizard, the hyperactive, slender, twelve inch-long Tiger Whiptail. An active hunter, it seems to never stop moving. When they are young and most vulnerable, whiptails sport cobalt blue tails, which entice would-be predators to focus on this dispensable appendage, perhaps allowing an escape from harm. The species of whiptail at the Garden

reproduces when male and female lizards mate. However, several other species of whiptails in Arizona are all females, reproducing by laying viable but unfertilized eggs that develop into genetically identical females (known as parthenogenesis); an amazing adaptation that eliminates the need for males in these species. Females engage in pseudocopulation by mounting and biting other females, which apparently triggers the hormonal changes necessary for ovulation and egg-laying.

Finally, we consider the ten-inch-long, aptly named Zebra-tailed Lizard. One of the swiftest of all the Garden's lizards, it brazenly curls and wags its black and white striped tail over its back, then flees in a burst of speed almost faster than the eye can follow. Most commonly seen off the paved paths, such as along the *Plants and People of the Sonoran Desert* Trail, they prefer open, sandy areas. Like the other lizard species, they are active hunters. Gardener Frank Insana once observed a Zebra-tail kill and eat an enormous Giant Desert Centipede.

At least one species of lizard that was once common in the Garden is no longer found here. The Horned Lizard was likely too slow-moving to survive the unnaturally high levels of urban predators, especially feral

cats, as well as the reduction of its primary food source, harvester ants. Conservation biologists have found that as smaller areas of natural habitat such as Papago Park become isolated, they will eventually support fewer species than do larger parcels such as South Mountain Park, which still supports about a dozen species of lizards. This loss of species diversity is accelerated when dispersal corridors (for example, desert washes) between the parcels are severed by roads and other developments, precluding genetic exchange and recolonization attempts.

In spite of being surrounded by a city, the Garden in Papago Park, like an island of natural habitat in an urban sea, continues to support a healthy diversity of fascinating lizard species. To learn more about lizards and other reptiles and amphibians found in the Garden, read the wonderfully illustrated *A Field Guide to Amphibians and Reptiles in Arizona* by Thomas Brennan and Andrew Holycross. Published by the Arizona Game and Fish Department, it is available at the Garden Shop as well as in the Garden library.

As the temperature begins to once again rise in the spring, keep a little of your attention on the ground, where you will undoubtedly be entertained by some charming lizard antics.



Western Banded Gecko



Young Tiger Whiptail



Zebra-Tailed Lizard



REMEMBERING AN AWESOME ADVENTURE

The letter is dated 7/13/08 and addressed to me with a “Dear Shannon” salutation. As I scan down to the middle of the page that was written on the river seven months ago I see the quote “There’s more to life than speeding up,” and remember the reflection activity we did with the young teen campers on last July’s San Juan River trip.

That quote made an impression on me because there is so much truth in those seven little words. It is so hard to slow down these days, not only for adults but for children and teens, too. I don’t recall things moving so rapidly when I was growing up, but feel that it’s definitely different for the generation growing up now. From preschoolers to teens, these young people lead fast-paced lives, with a thousand places to go and a million

things to do. Last summer, a float trip down the San Juan River was the perfect antidote for a small group of adventurers.

It began in a room with thirteen teens and their parents all wondering and asking questions about this San Juan River trip they had signed up for. It was the pre-trip meeting and there wasn’t a whole lot of socializing going on as many of these teens didn’t know one another. The staff discussed the

teens’ individual projects and the logistics of the trip, while stressing to the campers the need to pack light as space was limited. For the four-day journey they did not need (and were not allowed) anything electronic: no cell phones, computers, or iPods. They were going unplugged.

On departure day in July, to our pleasant surprise, they did just that – packed light and boarded the fifteen-passenger van sans electronic

by Shannon Wheeler, Early Childhood Programs Manager

The Teen River Adventure is more than an educational camp about one of Phoenix's main water sources; it's about getting kids outside and experiencing the natural world.

goodies. Even with the lack of cell phones, computers, and BlackBerrys, there was not a spot in that van that was not being utilized. I was ready, excited, and convinced that these teens were about to embark on a trip they would remember for the rest of their lives.

Eight hours and 360 miles later, we arrived at our first camp and were greeted by river guides from Grand Canyon Youth, a unique organization that partnered with the Garden two years ago.

For the next four days there was continuous laughter, learning, teamwork, and fun. We got up on the first morning to find breakfast ready and hot. The teens were informed right away that they should soak this luxury in because from here on out they were the chefs and dishwashers, along with other duties that would come their way. Teamwork was the common thread woven into everything that was done on the river. The teens were in charge of cooking, washing dishes, and bathroom set-up/take down, but it was the daily kayaking down the San Juan River that provided the ultimate teamwork experience.

Kayaking was a new experience for most of our campers and, in the beginning, many were excited but wary of testing the waters in their inflatable kayaks. Everyone stepped up to the challenge, though, and became more confident and successful with each passing day as they faced many twists, turns, and rapids along the way. Figuring out how to run a boat with two people paddling was the trickiest, so the tandem kayak became the true test of friendship.

Each camper had been directed to come prepared to instruct their peers on an individually selected topic related to the Colorado Plateau. The teens covered a variety

of topics from invasive species and astronomy to fossils and flash floods. After learning about invasive species in the San Juan River ecosystem from one of the campers, we took a hike guided by one of the river guides who was a botanist. The teens wondered what plants might have lived in the area hundreds or even thousands of years ago, and we all imagined how geologic forces had changed the land to become what is seen today. Curiosity had been sparked and they began asking questions about edible plants. Most of them wanted to taste various plants even after being warned about the bitter or piney taste. Time finally slowed down and learning became real, intimate, and connected to life.

The Teen River Adventure is more than an educational camp about one of Phoenix's main water sources; it's about getting kids outside and experiencing the natural world. This trip took teens into a new ecosystem and allowed them the time to absorb and investigate it. On reflecting upon how this trip shaped their perceptions of nature, camper Kyle Goodall said, "I had never been one for scenery, but the canyons were so cool that I found myself really liking them." There was a sense of awe and wonder about our world that one could see in the eyes of these young adults throughout the trip. If we can get one teen to appreciate the natural world and to feel a connection to our planet, we are one step closer to raising a future generation of earth stewards.

The San Juan River canyon is a place where geology is alive and dynamic, where history is rich and not so distant-seeming, and the beauty awe-inspiring. Looking across the landscape, you can almost see the tectonic plates moving in front of your eyes. All the subjects and concepts you learned in school become real here. The fossilized creatures you see and touch make it easy to imagine how life was long before your time. It makes your mind travel to a different place for the days you are there, and beyond. It all comes together in one large panoramic snapshot – the San Juan River; a place where I know that, for at least four days, thirteen teens were able to slow down, unplug, and take in the beauty of our earth.

The next opportunity for this adventure is coming up soon: July 9-13, 2009. For details and more information visit dbg.org or contact Jonathan Zucker, jzucker@dbg.org.





Campaign Raises \$17.8 Million for Garden Initiatives

Generous donors help meet the Kresge Challenge

The Desert Botanical Garden is grateful to every individual, company, foundation, and organization that contributed to the success of the *Tending the Garden* Campaign! A complete summary will be published as part of the 2008 Annual Report. Meanwhile, as of January 6, 2009, we are pleased to share with you that the Garden is preparing its report to The Kresge Foundation, which documents our successful completion of the \$3.7 million challenge. We anticipate receiving the Kresge grant award this spring.

Fulfillment of the campaign initiatives will continue through 2010. Completed projects are the Sybil B. Harrington Cactus and Succulent Galleries, Stardust Foundation Plaza, Ottosen Entry Garden, and funding for 10,000+ Title 1 school students to participate annually in the Sonoran Desert Adventure field trip program. In addition, the Garden's new Conservation Biologist position, held by Dr. Shannon Fehlberg, is made possible by the Dorrance Family Foundation.

The Campaign Cabinet, co-chaired by Oonagh Boppart and Hazel Hare, led the effort, which has exceeded the original \$16 million goal by 11%, with pledges, receipts, and planned gift commitments totaling \$17.8 million.

Contributions to the campaign range from \$5 to \$2 million, and include gifts from 2,621 donors including every Garden Trustee, 146 volunteers, 96 Patron's Circle members, 74 staff members, 34 businesses, and 18 foundations.

Valley Forward Awards

Last fall, the Sybil B. Harrington Cactus and Succulent Galleries were the proud recipients of the prestigious Valley Forward Environmental Excellence Award for Site Development and Landscape-Public Assembly. This award, also known as a Crescordia, recognizes excellence in contributions to the natural environment.

Valley Forward began the Environmental Excellence Awards in 1980 to recognize outstanding contributions to the physical environment and sustainability of Valley communities. Each year, individuals and organizations are nominated for a variety of categories including buildings and structures, site development and

landscape, environmental education/communication, environmental stewardship, and livable communities. In 2008, a record 130 entries were received, but only eighteen took home the coveted Crescordia.

The Garden has been honored with four previous Crescordias, which include Historic Preservation, 1990; Site Development and Landscape-Commercial Plazas, 2002; Environmental Stewardship-SRP Centennial Award, 2002; and Buildings & Structures-Large Scale & Community Development, 2006. The awards are currently displayed in the Desert Botanical Garden Library in the Nina Mason Pulliam Desert Research & Horticulture Center.

Photo Credits:

Cover photo	Dale Chihuly, <i>Scorpion Tails and Bamboo</i> , 2008, Desert Botanical Garden, Peter Brandeis
Page 2	Ken Schutz - Adam Rodriguez
Page 3	<i>Agave macroacantha</i> - Adam Rodriguez
Page 4	Dale Chihuly, <i>The Sun</i> , 2008 - Adam Rodriguez
Pages 5-6	<i>Chihuly: The Nature of Glass</i> installation photos 1-6 - Adam Rodriguez
Page 6	<i>Chihuly: The Nature of Glass</i> installation photos 7-8 - Peter Brandeis
Page 6	#9 Dale Chihuly, <i>Desert Wildflower Towers</i> , 2008 - Adam Rodriguez
Page 6	#10 Dale Chihuly, <i>Float Boat</i> , 2008 - Adam Rodriguez
Page 6	#11 Dale Chihuly, <i>Orange Hornet and Eelgrass Chandelier</i> , 2008 - Adam Rodriguez
Page 7	Gala photo - Mark Squire
Page 8-9	Brittlebush - Shannon Fehlberg
Page 10	American Chestnut - Timothy Van Vliet
Page 11	Sonoran Desert DNA Extraction - Shannon Fehlberg
Page 12	Desert Spiny Lizard - Paula Burns
Page 13	Desert Spiny Lizards - Adam Rodriguez
Page 13	Lizard photos - Thomas Brennan
Page 14	Teen Group Photo - Sarah Buss
Page 15	Teen River Adventure Photos - Courtesy of Desert Botanical Garden
Page 16	Cactometer - Andy Cruz
Page 17	Audio Tour - Adam Rodriguez
Page 17	Lowell Bailey at Golf Tournament - Gene Almendinger

Audio Tour Update

Audio tours debuted November 1, 2008.

Available in five languages, plus a family option, they offer information narrated by Garden staff in an entertaining format. Through May 31, 2009, enjoy additional facts about the Chihuly sculptures.

Experience the pleasure of setting your own pace as your questions about unique Sonoran Desert flora are answered. Free to Garden members, the cost is only \$3/unit to non-members; they are available at the SRP Visitor Center.

Development of this exciting addition to the Garden's educational program was made possible by generous gifts to the *Tending the Garden* Campaign by the Dorrance Family Foundation, SRP, and the Virginia G. Piper Charitable Trust.



Reserve now for Dinner on the Desert Saturday / April 25, 2009

Desert Botanical Garden will soon host its stunning spring event.

The evening begins with a stroll through the Garden, and a final glance at *Chihuly: The Nature of Glass*. Savor southwest flavors and sip cocktails while watching the sunset on Ullman Terrace. Bid on specimen plants in unique containers, garden art and benches in Webster Auditorium. Eliot Patio showcases *Auction: Live!* an on-going live auction featuring a Galapagos Islands Cruise, garden sculpture and private dinner. We will then gather on Boppart Courtyard and in Dorrance Hall for a fresh seasonal organic dinner. After dinner, enjoy tempting sweets along the way to the Stardust Foundation Plaza for dancing under the stars. A perfect evening's end with friends in the Garden. Proceeds from this fundraiser support the Garden's mission. Seating is limited, so early reservations are recommended. Please call Beckie Mayberry at 480-481-8179 for information and reservations.

SAVE THE DATE

Golfin' In the Desert 2nd Annual Charity Golf Tournament

Saturday, May 30, 2009
at ASU Karsten Golf Course.

For information on registration or sponsorships visit dbg.org, call Amy Walker at 480-220-0305 or email ajamy@fastq.com.



Connections:

Our colleagues at *Season for Sharing*, the Virginia G. Piper Charitable Trust, and the Nina Mason Pulliam Trust are working together to help reduce human suffering in our community resulting from the current economic recession.

Each of these organizations has made extraordinary efforts in recent months to increase funding for Valley-wide human service organizations. We salute their efforts and encourage Garden members to learn more about these organizations by visiting:

www.azcentral.com/season;
<http://communityrelief.pipertrust.org/home>;
and www.nmpct.org.

In the past, the Garden has received very generous support from each of these organizations in support of our own mission of conservation, education, research, and exhibition of desert plants. But now, we believe it's time for us to give back to the community. To that end, Garden staff voted to cancel our annual holiday party, and instead contribute what would have been spent on that event to *Season for Sharing 2008*. Staff and volunteers also conducted a food and supply drive for homeless shelters in January. We contributed blankets, clothing, and hundreds of other essential items to area agencies that serve homeless men, women, and children.

We at the Garden will continue to look for other ways we can give back to the community, and encourage all of our readers to do the same.

in appreciation

The Desert Botanical Garden is grateful to all 19,420 members and donors for their support. Acknowledged in this section are members and donors giving \$2,500 or more over the quarter, from September 16 - December 15, 2008. Included are memberships and unrestricted gifts to support the Garden's annual operations.

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The Mission Statement of the Desert Botanical Garden

The Garden's commitment to the community is to advance excellence in education, research, exhibition, and conservation of desert plants of the world with emphasis on the Southwestern United States. We will ensure that the Garden is always a compelling attraction that brings to life many wonders of the desert.



Friday, March 27, 7-11 p.m.

\$70 members **\$75** non-members

Put a new spin on your Friday night and join the party at *Agave on the Rocks*, the Desert Botanical Garden's hippest social event. Enjoy Garden scenery, including *Chihuly: The Nature of Glass*, while sipping margaritas and sampling delicious cuisine prepared by renowned Valley restaurants and caterers. Experience eclectic entertainment featuring the talents of ONE DJs: dk:stickler & World Famous Rani "g", Calumet - the Valley's own Rock Soul Funkateers, and the innovative arts of Gregangelo & Velocity Circus. **Guests must be 21 years or older to attend.**

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SONORAN QUARTERLY

FOR MEMBERS AND FRIENDS OF THE DESERT BOTANICAL GARDEN

PHOENIX, ARIZONA JUNE 2009, VOLUME 63, NO. 2



FAREWELL TO CHIHULY

WHAT AN INCREDIBLE HONOR IT WAS FOR OUR GARDEN TO HOST SUCH A WONDERFUL (AND POPULAR) EXHIBIT!



By the time you receive this issue of *The Sonoran Quarterly*, *Chihuly: The Nature of Glass* will be packed up and on its way back to Seattle.

Many people contributed to making this exhibit such a smashing success—including our volunteers, staff, board members, and corporate sponsors. But the most important “thank you” of all must go to you, our members. We appreciate how generously you accommodated our need for timed admissions in order to avoid major congestion in our parking lot. And we know how graciously you shared the trails with the thousands of new visitors who filled the Garden each day, for more than six months.

Now that *Chihuly: The Nature of Glass* has left, daily activities at the Garden are returning to normal. Most of the plants and people here are going into some form of hibernation during the hottest summer months, but we will continue to offer our popular Flashlight Tours on Thursday and Saturday evenings. On select Thursdays our newest event, *Spiked!*—cocktail parties for the young (over 21 years) and the young at heart—will also be offered. Both programs are designed to help you beat the heat and enjoy the Garden throughout the summer months.

This fall, the Garden will present a fantastic new line-up of festivals, events, and activities that will delight people of all ages. We will kick off the season with the new *Biergarten*, an outdoor celebration of beer from around the world. *Corks & Cactus*, our popular wine tasting event, moves into the cooler month of November and expands

to a Garden-wide event, allowing more guests to celebrate the fruit of the vine. The fall butterfly exhibit, *Mariposa Monarca*, returns to delight visitors with live Monarch butterflies, and the Fall Plant Sale will arrive just in time for your seasonal planting. We will be expanding the *Great Pumpkin Festival* so more families will have the opportunity to get lost in the hay-bale maze and find that perfect pumpkin in the patch; and *Día de los Muertos* will bring the tradition of old Mexico to the Garden for a weekend of art, culture, and honor of departed loved ones. And if you love chocolate, you won't want to miss *Chiles & Chocolate*—by far the tastiest weekend at the Garden.

As the weather cools and we begin the holidays, a wonderful new season of *Las Noches de las Luminarias*, the Garden's annual holiday tradition, will unfold as the best Lumi ever! Toward the end of summer you will receive more information about all of these programs in the Fall Calendar of Events and, as members, you will be the first to hear about all the new plans.

Until then, stay cool and come to the Garden often in the evening to have fun while staying out of the sun.

Ken Schutz,
The Dr. William Huizingh Executive Director

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Don't miss Thursday and Saturday evenings as you explore the Garden on one of the fun Flashlight tours.

On our Cover

Black-spined Prickly pear,
Opuntia macrocentra.
Photo by Adam Rodriguez
adamsphoto@cox.net

RESEARCH HELPING UNRAVEL GRAND CANYON MYSTERIES



Like each of the 4.5 million people who visit the Grand Canyon each year, I stand at its edge in awe and reverence, walking away feeling a bit less important. When I hike down into the Canyon, I notice how steeply it descends. In fact, as I descend I travel through five (of seven) life zones and 129 vegetation communities.

I see different formations and outcrops such as Muav limestone, Dox and Hakatai shales exposed in this geological wonder.

I also notice that some plants, particularly cacti and yuccas, look odd, perhaps as if they are products of hybridization. After numerous observations, notes, photographs, and field collections, I take them back to the Garden for further study. Is it a weird anomaly or mutation, I wonder, or a plant that falls just outside its supposed range of variation? Or is it a new species?

Many times a field collection may not be so obviously questionable—not until I work with a microscope and an identification key will I realize that a particular plant does not quite fit the written descriptions. Further

comparisons with herbarium specimens may provide more clues as to its identity, or sending the specimen(s) to a specialist may be required.

Let us now look into three examples of Grand Canyon mysteries that Herbarium staff have been investigating.

***Hesperoyuccas* and Their Moths**

Our Lord's Candle is a beautiful rosette-forming plant found in southwestern U.S. and northern Mexico. These plants were formerly placed in the genus *Yucca* and represented by only one species, *Yucca whipplei*. Recent taxonomic treatments, however, recognize three distinct species belonging to the genus *Hesperoyucca*, a group more closely related to *Hesperaloe* than to *Yucca* (Clary 2001).

by Wendy Hodgson, Curator of Herbarium and Research Botanist

Hesperoyucca peninsularis is restricted to north-central Baja California, *H. whipplei* to southern California, and *H. newberryi* (fig.1) to the Grand Canyon region. *Hesperoyucca* species spanned large regions of the Mojave and Sonoran deserts until the latest major glacial period, the Pleistocene (Van Devender 1990), but has shrunk considerably during the warmer, dryer Holocene that started approximately 11,000 – 13,000 years ago. With fragmentation there is isolation of, and less gene flow between, populations, resulting in the patchy distribution we see today.

Hesperoyucca species are pollinated by two subspecies of a single moth, *Tageticula maculata* ssp. *maculata* and *T. m.* ssp. *extranea* (Segraves and Pellmyr 2001). The moth species represent an ancient lineage, having evolved approximately 32-40 mya (million years ago), near the time pollinator species arose; the two subspecies evolved separately approximately 10 mya. The two subspecies of moth are characterized by different wing patterns: ssp. *maculata* has white speckled wings, and its host plant is *H. whipplei* in the northern coastal California and Sierra Nevada regions, while ssp. *extranea* has black wings and pollinates southern coastal California and northern Baja California *H. whipplei* (around Ensenada) and *H. peninsularis* (near El Rosario and Jaraguay). The Grand Canyon moth pollinates *H. newberryi* and is significantly different from other forms of ssp. *extranea* at the genetic (not morphologic) level, having been probably isolated from other moths for at least 11,000 years (Segraves and Pellmyr 2001).

The Western Grand Canyon began to evolve ca 17 mya while the eastern third (Marble Canyon) may have started to develop before 3.7 mya (Polyak et al 2008). With the continuing isolation of the Grand Canyon moth and plant populations from southern California and northern Baja during the warmer Holocene period, there followed greater

differentiation of both the moth and the plants (Segraves and Pellmyr 2001). Clearly, the evolutionary history and distribution of the moth is related to the pre- and post-glacial distribution of *Hesperoyucca*, and the two are inextricably tied to one another. Grand Canyon populations of these moths and plants, as well as those in northern Baja California, provide ample opportunities for study.

Garden researchers significantly increased the number of herbarium specimens of *Hesperoyucca*, and also provided moths and fruit samples to Dr. Olle Pellmyr at the University of Idaho in Moscow, Idaho, for study. Further documentation and study by Garden researchers, including molecular, chromosome, and morphology work, will help us understand these populations and their relationships with other *Hesperoyucca* species, as well as processes of species development and patterns.

An intriguing question that offers promising research opportunities for Garden staff, is whether the decline of *Hesperoyucca* species was due in part to their overexploitation as a food source hundreds or even thousands of years ago. It would be analogous to the hypothesis that certain large mammals (for example, sloths) in the Grand Canyon region became extinct as a result of overhunting during the Pleistocene

Thistles - Beautiful Plants with a Bad Rap

The reputation of North American native thistles has suffered because of a few invasive species from Eurasia, as the general public deems all species to be unwanted, pesky weeds (Keil 2002). Granted, they are all spiny plants that are highly variable due to hybridization and other phenomena, but to botanists and others they are also beautiful species that represent one of North America's evolutionary success stories (Keil 2002).

Like *Hesperoyucca* and other plants, thistle distribution and evolution was greatly affected by events during

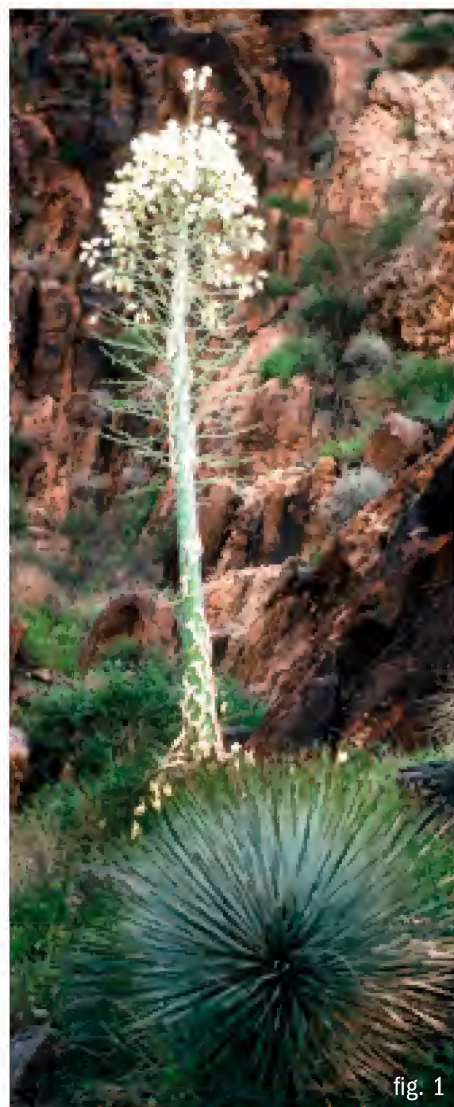


fig. 1

Clearly, the evolutionary history and distribution of the moth is related to the pre- and post-glacial distribution of *Hesperoyucca*, and the two are inextricably tied to one another.



fig. 2



fig. 3



fig. 4

the recurrent glacial and interglacial episodes of the Pleistocene. Taxa that are currently isolated may have been in contact during glacial episodes, with the resultant possibility of hybridization and genetic exchange (Keil 2002).

Rydberg's thistle is a beautiful, often massive plant restricted to hanging gardens and seeps in southwestern Utah (fig.2). Hanging gardens are unique, lush, island-like mesic (moist) habitats surrounded by xeric (dry) canyon walls in the Colorado Plateau region. They are characterized by having shade and moisture, providing habitat to a diverse assemblage of plants that differ from the flora of surrounding xeric cliffs (Fowler et al. 2007). Without the constraints of little or no moisture, Rydberg's thistle is unique amongst the vast majority of thistles in that it develops into characteristically lush, large plants nearly two meters tall, with shiny, glabrous (no hairs), thick, large leaves. (Fig. 3).

Populations in upper Marble Canyon (within Grand Canyon) were identified as *Cirsium rydbergii*, but appear to be somewhat different. In addition, approximately 140 to 240 miles downstream from these populations occur another kind of thistle that are also large, lush plants having large, thick, glabrous, and shiny leaves (Fig. 4). The flower heads are different from Rydberg's thistle, but the vegetative parts are remarkably similar. Specimens from this population were identified by thistle specialist David Keil as Mohave thistle, *Cirsium mohavense*, despite their amazing resemblance to *C. rydbergii* and the Marble Canyon thistles. Mohave

thistle ranges from scattered mesic sites in the Mohave Desert.

Did Mohave and Rydberg's thistles once occupy a much larger area within (and outside) Grand Canyon? In the distant past, could they have hybridized with each other within the Canyon, and then, with the onset of the warmer Holocene era, retreated to their current sites? Could both Grand Canyon thistles represent new taxa, becoming more isolated from each other and from the true Mohave and Rydberg's thistles farther west and east, respectively? Or could they represent "good" *C. mohavense* and *C. rydbergii* that are products of convergent evolution – an ingenious evolutionary process whereby organisms that are not related evolve similar traits in response to similar environments, in this case, moist seeps in the Mohave Desert? Interestingly, one of the Marble Canyon populations was identified as both *C. mohavense* and *C. rydbergii*! Garden researchers, using both traditional and molecular techniques, are hoping to answer these and other questions that will help clarify species relationships and patterns.

Cirsium rydbergii, *C. mohavense*, and the Grand Canyon thistles are rare taxa, having limited, patchy distributions. Hybridization is common in the genus and can break down species delineations, resulting in the emergence of new characteristics, which can be detrimental if rare species are involved. Finally, native thistles, particularly those that are rare, have come under threat from bio-control programs instituted to suppress

populations of weedy, introduced thistles (Keil 2002). Research, and the resultant increase in knowledge, will assist in managing rare plant populations such as these.

Literature Cited

- Clary, K. 2001. The genus *Hesperoyucca* (Agavaceae) in the western United States and Mexico: new nomenclatural combinations. *Sida* 19(4): 839-847.
- Fowler, J., N. Stanton, R. Hartman. 2007. Distribution of hanging garden vegetation associations on the Colorado Plateau, USA. *Journal of Botanical Research Institute of Texas* (1): 585-607.
- Keil, D. 2000. *Cirsium*. In: *Flora of North America*, eds. *Flora of North America Editorial Committee*. Oxford University Press.
- Polyak, V., C. Hill and Y. Asmerom. 2008. Age and evolution of the Grand Canyon revealed by U-Pb dating of water table-type speleothems. *Science* 319: 1377-1380.
- Segraves, K. and O. Pellmyr. 2001. Phylogeography of the yucca moth *Tegeticula maculata*: the role of historical biogeography in reconciling high genetic structure with limited speciation. *Molecular Ecology* 10: 1247-1253.
- Van Devender, T. 1990. Late Quaternary vegetation and climate of the Sonoran Desert. In: *Packrat Middens: the Last 40,000 Years of Biotic Change*. Eds. J. Betancourt, T. Man Devender, P. Martin. University of Arizona Press.

Describing a Species New to Science.

Whenever I find a plant I have never or have rarely seen before, I get excited. Such was the case when I found an attractive little plant in the Canyon. I knew it was a blazingstar, *Mentzelia* (Loasaceae), but it was different from all the others I had ever seen before. They are difficult to identify because one has to have flowers, mature fruits, and seeds in order to be accurate. Dr. Charlotte Christy, *Mentzelia* expert, had asked me to keep an eye out for a particular species in the Canyon that she wanted to name as new. Despite its rarity, I was able to find and document a few populations for her, all without

flowers, though. I also found some other plants that were similar to, yet different from, her species.

A few years later, while on a National Park Service (NPS) research river trip with vegetation Program Manager Lori Makarick, I finally found these plants with flowers. The flowers were white, unlike the yellow flowers of other blazingstars. Andrew Salywon, Assistant Herbarium Curator, and I decided to do a thorough study of these new species, including molecular work. I soon received word that another team of researchers at Washington State University, in Pullman, Washington, Dr. Larry Hufford and Ph.D. candidate John Schenk, were not only working on the genus, but saw one population of this white-flowered blazingstar while on a rafting trip down the Colorado River, recognizing it as something new! Rather than trying to publish it ourselves, we decided it best to join forces and together describe and name it *M. hualapaiensis*, the Hualapai blazingstar. It was named in honor of the Hualapai Nation, which has been helpful and supportive of the Park's and Garden's work in the Canyon, and upon whose land some of the populations occur (Schenk, et al. in press).

Hualapai blazingstar belongs to a recently recognized group of narrow endemic perennials that are restricted to specific soil types on the Colorado Plateau (Holmgren and Holmgren 2002). The Hualapai blazingstar is mostly limited to the Muav Formation, a limestone layer dating back 515 mya. Its white flowers are similar to those of another species in the Chihuahuan Desert. Even though they are both moth-pollinated and have white flowers, they are not closely related, providing another example of convergent evolution. Molly Gill, Garden Botanical Art and Illustration Program student, worked closely with us in illustrating the fine characteristics that distinguishes this species from others. The beautiful illustration is included in our description to be published in *Brittonia* and exhibited at the American Society



Berlin Agave-Yucca Forest Planning and Design Begins

By Elaine McGinn,
Director of Planning and Exhibits

Design development for the Garden's newest exhibit initiative, the Berlin Agave-Yucca Forest, began in March with the selection of *e group* as the landscape design firm. The *e group* is a Phoenix based company that has 30 years experience in working with desert landscapes. Their firm includes landscape architects, horticulturists, and planning and graphic specialists.

Located south of the Sybil B. Harrington Succulent Gallery, the new exhibit will provide visitors with a unique opportunity to view the diverse agave and nolina families. Interpretation will reinforce concepts about desert plant adaptations and their horticultural and historical significance to the Garden's living collection.

The schematic design concept for the Agave-Yucca Forest is best described as an exaggerated boulder experience blanketed and edged by agaves, yuccas, and nolas, providing a sense of enclosure and immersion.

Funded by a generous gift from Howard and Joy Berlin to *Tending the Garden* Campaign, the Berlin Agave-Yucca Forest is scheduled to open in November, 2009. Construction for the new exhibit will begin in July and continue through the fall.

of Botanical Artists Annual Meeting and Conference to be held in part at the Desert Botanical Garden in October. Our other unknown *Mentzelia* remains undescribed; we will describe and name it as soon as we are able to find and document additional populations of this even more rare plant.

Literature Cited:

Holmgren, N. and P. Holmgren. 2002. New *mentzelias* (Loasaceae) from the Intermountain Region of the Western U.S. *Systematic Botany* 27(1):747-762.
Schenk, J., W. Hodgson and L. Hufford. In press. A new species of *Mentzelia* section *Bartonia* (Loasaceae) from the Grand Canyon, Arizona *Brittonia*.

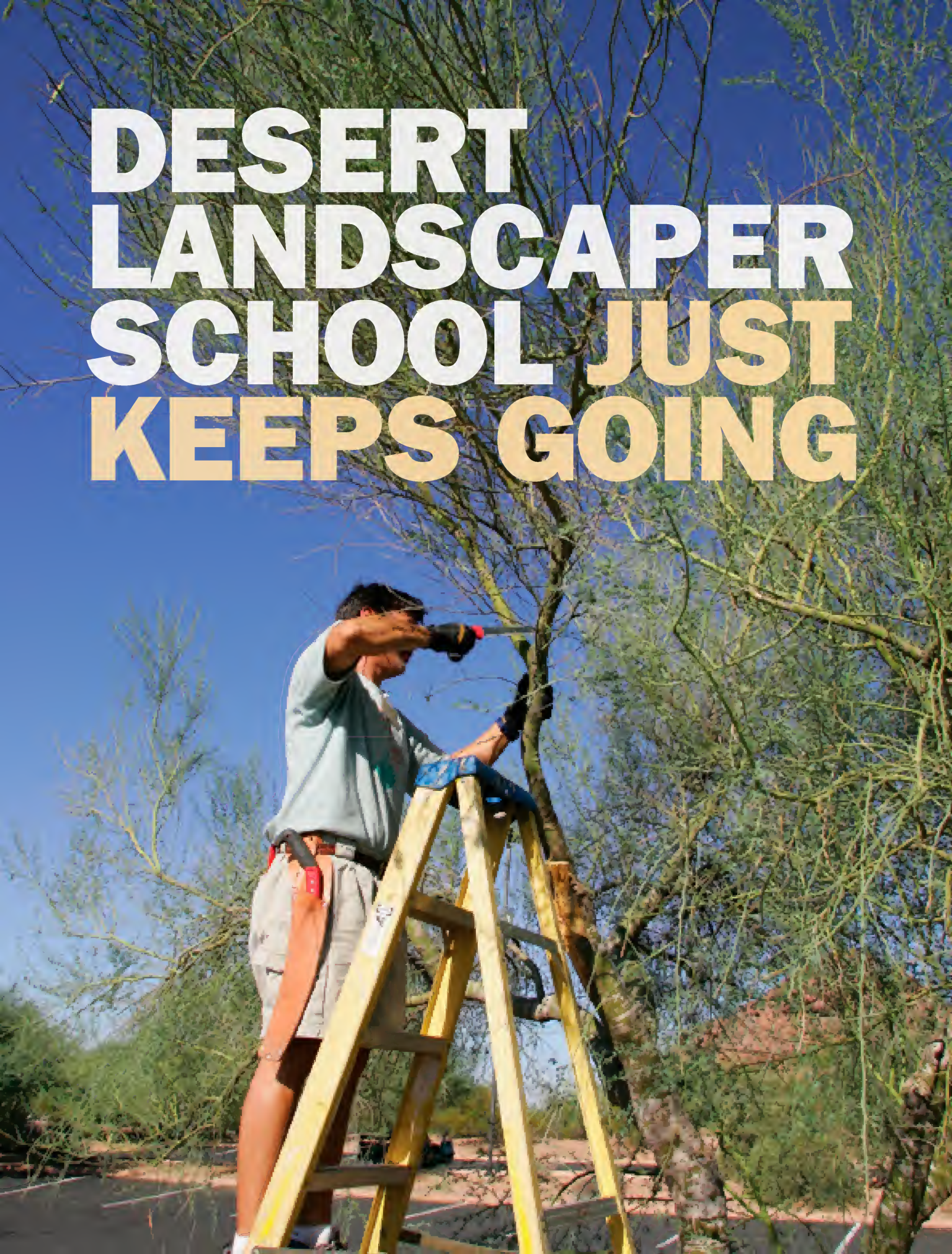
Final Thoughts

We will continue to try to grasp even a basic understanding of what plants occur in the Canyon region as well as how they operate and interact within and between ecological communities. Studies such as those described in this article clearly illustrate the need for more investigation. Surprisingly, as diverse and complex as the Canyon is, little work has been done on plant speciation patterns, endemism, and evolutionary biogeography within the Canyon. Researchers at the Garden, in close cooperation with Grand Canyon National Park Service staff as well as the Hualapai Nation, are attempting to change this—to unravel a few of the Canyon's many mysteries.

Field Work Connects with Exhibits

One of the strengths of the Desert Botanical Garden's exhibit process is the opportunity for research staff to participate on exhibit development teams. Field work can assist in decisions about plant selections for displays, and scientific research provides an important resource for interpretation. The Garden's newest exhibit, the Berlin Agave-Yucca Forest, will benefit from the long history of research of the Agave Family by Garden staff, even as we continue to study aspects of the family's taxonomy and phylogeny, speciation processes and patterns, ethnobotany, and pollination biology.

DESERT LANDSCAPER SCHOOL JUST KEEPS GOING



Like the Energizer Bunny®, the Desert Landscaper School and its students just keep going. For twelve years, the curators and horticulturists at the Desert Botanical Garden have shared their passion and the best practices in the care of desert-adapted plants. Every year, more than one hundred students work for nine months to earn the title of Certified Desert Landscaper (CDL).

Many things have changed in the past twelve years, but one that has not is the school's contribution to sustainability in our community. After the graduation ceremony in May, there will be more than 1,000 CDL's in our community, each armed with the desire and knowledge to create and care for beautiful, sustainable urban landscapes. Did you know that merely by selecting native and desert-adapted plants a landscape can be naturally sustainable? CDL's know this. What an amazing knowledge base these graduates hold for our community. How did this come to be?

Responding to a Need

The Desert Landscaper School was created in 1997 as a direct response to the many community members seeking a landscaper who really understood desert plants. They often described the sadness of returning home to see shrubs sheared into cubes, or their prized agaves shaped into the form of pineapples.

Then-Director of Horticulture, Cesar Mazier, realized that the first step in starting a new school for training professional landscapers was to find some space in which to house it. He found what he needed in an old horticulture storage building, after emptying it of tools and frost cloth. The facility soon got drywall, an air conditioner, tables, and chairs, in readiness for the first class.

The next step was to find the right person to run the school. Fresh from completing his master's degree in horticulture, John Schluckabier was charged with designing the school's format. Cesar's primary guideline for him was that the school be heavily weighted in favor of hands-on learning. That model persists today; "Doing is Learning" is one of the school's touchstone phrases. The founding goal of the school—to create a corps of professional landscapers skilled at installing and maintaining beautiful urban desert landscapes—was realized in 1998, when the first graduates received their certification, and if they chose, a place on a referral list available to all those callers looking for a professional desert landscaper.

by Rebecca Senior, DLS Coordinator





What does certification mean?

Certification means that the student has spent one morning a week for nine months with one of the curators, horticulturists, or industry experts brought in to teach specialized areas like irrigation, water harvesting, or design. It means that they have passed the weekly quizzes, session exams, and other course work with a grade of 70% or better. To be certified, students must have learned to identify sixty plants by both their common and botanical names. The sixty plants are carefully chosen by the Garden's curators and represent the backbone of a plant palette for a desert landscape.

To complete the requirements for certification, students may miss only one class during each of the three semesters. The rewards for becoming certified include receiving a beautiful certificate that they can proudly display, along with the right to use the title of Certified Desert Landscaper when presenting themselves. Being certified also means that the students are determined and committed people who were willing to learn the many skills needed to create and maintain a desert landscape.

To be certified, students must have learned to identify sixty plants by both their common and botanical names.



A Unique Format

The program is divided into three sessions each with a specific focus.

The first two sessions concentrate on forming the base of knowledge, with topics in plant identification and selection, soils and fertilizers, planting and staking, pruning trees and shrubs, watering and irrigation systems, design and installation, disease, insects, pesticides, and the all-important concept of integrated pest management. There is a class on each major life form of desert plants: cacti, agaves, trees, shrubs, wildflowers, and other succulents.

The school is well-stocked with tools, and the students get to use them in many ways: learning to plant and stake trees, practicing tree pruning for an entire class, or learning to solder and glue while creating an irrigation system. The third session is almost entirely hands-on, as students complete a final project of designing and installing a landscape. They measure, plan, and draw, then exchange the fine hand tools of the designer for shovels, picks, and sometimes jackhammers.

A unique, invaluable aspect of the program is that the curators and horticulturists at the Desert Botanical Garden, itself, form the core of the instruction course. Who better to teach the students about agaves than the Curator of the Agave and Aloe collection? Who better to teach the care and selection of a life form, plus the accumulated tips, tricks, and pearls of wisdom than the person who works with those plants every day and is infectiously passionate about them?



The Final Project

For most of the last twelve years, the final project has been to design and install a new landscape for a family receiving a Habitat for Humanity home. Ordinarily, five houses are completed in time to allow the five groups to work on them. This year, however, the timing was slightly off so the projects selected came from various sectors of the community.

One group of students designed a landscape full of flowers for a home built by the Town of Guadalupe for a woman and her family who love multi-colored flowers. Wednesday's class project is a landscape designed for a battered woman's shelter. Friday's class will transform a landscape sporting only gravel and one lonely tree into a beautiful desert landscape for a family that recently moved in with the help of New Town, a not-for-profit group that creates affordable housing.

The last two houses are landscape renovations for some wonderful men in assisted living homes owned by our great partner, the City of Tempe. The two Saturday classes (one is taught in English and the other in Spanish) look forward to problem-solving these landscapes and creating exciting, safe, and easy to maintain environments for these gentlemen to enjoy from their well-used front porches.

Perspectives from Graduates

From the class of 2004, Maria Elena sent these thoughts: My name is Maria Elena Arias; I graduated on 02 June 2004 (Spanish class) at the Desert Botanical Garden. My biggest satisfaction was to attend the class presented by Mr. Jaime Toledano. That was a unique experience in which we learned how to manage the desert plants and the ambient resources. I learned very much. I recommend to all of those who have this learning opportunity to take advantage of this course. It's fantastic.

Mi nombre es Maria Elena Arias, me gradue el 2 de Junio del 2004, en el Desert Botanical Garden, (en la clase de espanol). La mas grande satisfaccion fue el atender la clase dictada por el Senor Jaime Toledano. Esta expeiencia unica en la cual se aprende el cultivo y manejo de las plantas del desierto y conservar los recursos sostenibles del medio ambiente. Yo aprendi y disfrute mucho. Recomendando a todos los que tenga la oportunidad de atender estas clases. Es simplemente fantastico.

From the class of 2005, George Susich said:

The school is a must for any person new to the Valley, most of whom have never before lived in a desert environment and so it looks dead and brown to them. You will gain a deeper appreciation of, and sensitivity for, the environment we live in and its cycles. The school experience demystifies the desert and the plants that grow in it; it's almost like the Rosetta Stone of the desert environment. If you have always looked at landscaping as an asset to your home, you will learn that an even greater asset to your home and community is a sustainable landscape.

From the class of 2006, Shelley Cohn had this to say:

It was a great joy to learn about the cacti, trees, and shrubs in the context of the Garden. You will learn about systems of pest control and irrigation. This is a great plus, not necessarily so you can do these jobs, but so that you will learn to ask the right questions. To hear from the Horticulture staff each week about the different care of all those plants and then take that knowledge into the experience of designing and then installing a landscape in collaboration with Habitat for Humanity is an extraordinary experience for anyone. [I remember the look on Shelly's face when she realized, while sitting in the bare dirt back yard of the Habitat install, that she had to redo part of the irrigation system. I do not believe Shelley has been installing irrigation systems, but has been asking contractors the right questions.]

The Desert Landscaper School benefits both the community and the many diverse students in so many ways. The founding mission of training professional landscapers is still vital to the school, but many are drawn who desire only to learn about the desert and its plants. All are welcome to join that amazing thousand-strong group caring for and promoting the use of desert-adapted plants in the most beautiful ways. Summer is the right time to sign up for the next class, which starts in September.

Desert Landscaper Certification Program

Classes start September 8, 2009.

Register now for this popular 30-week, nine-month course that offers practical, hands-on learning experiences in landscaping and horticulture. The course is geared toward professional landscapers, homeowners, career changers, newcomers to the Valley, and plant enthusiasts alike. Garden curators, expert horticulture staff, and guest instructors teach the three-session program. Upon completion, students will have earned the honor and distinction of calling themselves Certified Desert Landscapers, and will receive a certificate from the Desert Botanical Garden. The course is taught in both English and Spanish. Visit www.dbg.org/index.php/gardening/landscapeschool to register online, or call Rebecca Senior at 480-481-8161, or Jaime Toledano at 480-481-8169 (Spanish language information).



Fouquieria macdougalii



FACINATING FOUQUIERIAS FOR YOUR LANDSCAPE

We have a number of phenomenal plants within the genus (or group) *Fouquieria* that can serve as accents in the landscape.

Generally these plants have stiff branches covered with fissured bark and rather substantial spiny structures, which are the remains of leaf stems after they drop from new branch growth. Some species have a lower-branching, shrubby growth habit, while others are taller tree forms. A few form a succulent, enlarged base called a caudex. Tubular flowers range from brilliant red to white. Most of the blooms will attract hummingbirds to your garden.

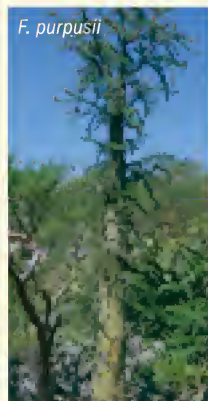
Fouquierias are found in hot arid regions of Mexico and southwestern United States. Although they hold some moisture within their stems to sustain them through dry periods, most of the species are not considered true succulents. A number of the species are drought deciduous, dropping their foliage to reduce the amount of moisture lost from their systems during dry periods. Most are warm season growers. *Fouquierias* are not difficult plants to cultivate in the landscape and can even make stunning container specimens that are easily cared for. Provide a sunny exposure and well-drained soil. Most of them will establish well with a good watering once a week through their first summer. In subsequent years, cut back to providing supplemental water just once or twice a month during the hot season. They are generally cold hardy to 25° F. Two of the *fouquierias*, the ocotillo and boojum, are more commonly used in landscapes.

The ocotillo (*Fouquieria splendens*) is the only species native to Arizona, also extending as far south and east as the Chihuahuan Desert. It develops multiple wand-like stems that emerge from the base of the plant, rising up to heights varying from 6 to 30 feet. The waxy bark develops interesting fissures among the many spines of the branches. The ocotillo is the perfect example of an adaptation to our desert environment. It can drop its foliage during dry spells anywhere from two to six times in a year and sprout new leaves within 24 to 48 hours after a good soaking rain. The ocotillo typically blooms in the spring, producing tight clusters of brilliant orange-red, waxy flowers at the stem tips. This is among the most cold-hardy of the *Fouquierias*. We currently provide seed-grown specimens at our plant sales. If you choose to work with a bare root plant, you can find instructions for successful establishment on our website –dbg.org.

The boojum tree or cirio (*F. columnaris*) develops a tall, large-based, tapering central trunk from which numerous horizontal branches emerge. Forking or branching might occur on the upper portion of the grayish-green trunk. Heights of 30 to 60 feet are possible with aged specimens in habitat, but development is slow and landscape plants more commonly reach 15 to 25 feet. These odd-shaped trees develop branched bloom stems at their tops during the summer with fairly inconspicuous, fragrant, cream-colored flowers. They are summer deciduous and should be carefully watered during this period, so as to prevent overwatering and rot. Work carefully around your boojum, too, to avoid injury to the trunk. A seemingly slight wound in the trunk can allow a bacterial infection to take over and cause the demise of your plant.

Mexican tree ocotillo (*F. macdougalii*) ranges in height from 6 to 18 feet, with an upright tree-like form in its native habitat. Contrastingly, it tends to be a large shrub in cultivation in our area, growing 6 to 8 feet tall and wide from a short thick

by Kirti Mathura, Curator of Shrubs



trunk. Thin, bronze, papery sheets of bark peel from the surface, exposing the wide green trunk (or trunks) in the taller wild form. Rain triggers the bloom cycles, with brilliant red flowers opening in pendulous sprays from the branch tips in the spring, and intermittently through the year. Good monsoon rains will help ensure a magnificent fall bloom.

Baja tree ocotillo or Palo Adán (*F. diguetii*) ranges in growth habit from a shrub to a small tree 3 to 25 feet in height. Very spiny thickened branches develop from a short thick trunk, which might have diagonally patterned greenish-bronze and grey striping with age. Bright red flowers are borne in clusters at stem tips sporadically through the spring season.

Another ocotillo (*F. shrevei*) has a shrub form 3 to 8 feet tall. Upwardly arching stems develop from a short bronze-colored trunk, similar in form to our native ocotillo. A spring bloom occurs with fragrant white flowers developing singly along the upper stems.

Rabo de Iguana (*F. ochoteranae*) has a small tree growth habit reaching 12 to 24 feet in height. It develops one or two

narrow main trunks that branch higher up with an arching, dichotomous pattern. The trunks have an attractive dark bronze and grey patterning. Flowers are dark red-maroon, borne in elongated tight clusters (similar to our native ocotillo) along the branches. In its native habitat in Mexico, blooming occurs during the dry winter or spring season.

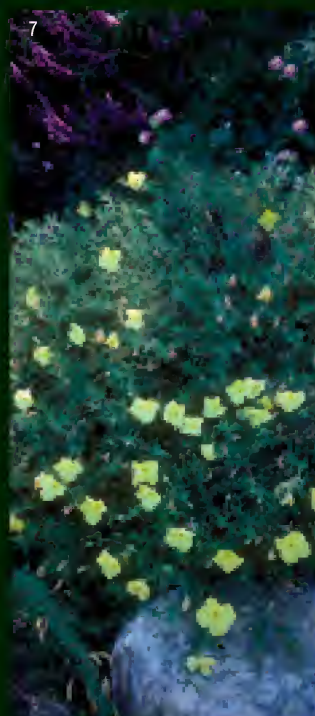
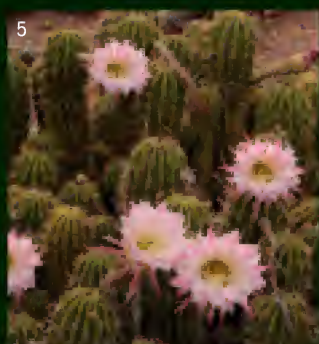
Árbol de Barril (*F. fasciculata*) is a shrubby form reaching 8 to 15 feet in height and spread. One or a few main trunks develop, each with a low, wide, succulent caudex. Above these barrel-like forms, narrow stems emerge with many branches. Clusters of small fragrant white flowers open from mid-winter to spring, which is the dry season in their native region of Mexico.

Baja tree ocotillo (*F. burragei*) forms a caudex supporting two to five short, dark greenish-bronze trunks from which several lightly branching stems develop. The plant grows 3 to 10 feet tall. Following summer or winter rains, blooms occur at branch tips with the flowers arranged on a narrow elongated stem. Color can vary from white to rose-pink to red.

Spiked candlewood or rosalillo (*F. formosa*) is a small tree ranging from 10 to 25 feet in height, with one or two enlarged lower trunks. Trunk coloration varies from dark bronze to yellow. Thin papery sheets of tissue peel from the surface, adding interest seasonally. The flowers are orange-red to scarlet, typically appearing between fall and spring in spikes at stem tips.

The candlewood (*F. purpusii*) produces one or more conical enlarged trunks, succulent in nature. Mature plant height ranges from a shrubby 3 feet up to a more tree-like 15 feet. Many branches extend from the smooth green trunks and large stems. Branch tips develop clusters of small white flowers during the dry winter season of their native habitat, or perhaps in the springtime in cultivation.

Visit the Garden to see a variety of the species on display in our collection. Also look for some of these fascinating fouquierias when you shop at our semi-annual plant sales. One of them could be just the accent plant you have been looking for, whether you grow it in the ground or in a container.



Don't Miss These **Night-Blooming** FLOWERS

by Cathy Babcock, Director of Horticulture

The night garden is a summer garden: all night-bloomers open their flowers and release their fragrance during the warm months. Just as the heat of your skin releases the scent of your favorite perfume or cologne, so does the heat from the waning day cause the flower perfumes to waft for a distance of up to a hundred feet. Their sweet scent will attract bats and moths to pollinate them during the night. Although they open sometime between dusk and midnight, flowers of night-bloomers are generally open until mid-morning. The following is a list of our ten favorite night-bloomers:

1. *Peniocereus greggii* - Arizona queen of the night - locations throughout the Garden, largest plant is across the path from Eliot Patio.

One always knows, by its elusive fragrance, when this cactus is blooming. Large five-inch, white flowers open in the evening and last until mid-morning. This cactus has long slender stems growing into other shrubs, generally creosote, making it difficult to locate.

2. *Harrisia* spp. - located on the north and south sides of Quail Run across from Webster Auditorium, and Steele Herb Garden.

This is a snaky-stemmed cactus whose flowers are generally white and about five to six inches across. It is an awesome sight when there are a multitude of flowers that open all at the same time.

3. *Sansevieria* spp. - mother-in-law's tongue - located in the Succulent Gallery, Steele Herb Garden, and northeast side of Archer House.

This succulent from Africa takes everyone by surprise. A common house plant, it does not generally bloom unless planted in the ground or grown outside. Flowers are small, white and borne on spikes; they are very fragrant and open at night.

4. *Mirabilis* spp. - four o'clock - located in the Steele Herb Garden, and Desert Wildflower Trail (*M. jalapa*, *M. multiflora*, *M. longiflora* and *M. californica*).

Flowers, some of which are very fragrant, open in late afternoon, fading by mid-morning the next day. Flower color varies from magenta to white, depending on the species. Attracts hawk moths and hummingbirds.

5. *Echinopsis* spp. - Easter lily cactus - located across from Archer House, Boppart Courtyard, Stardust Foundation Plaza, Cactus Gallery (*Echinopsis candicans*, *Echinopsis* 'flying saucer', *Echinopsis* hybrids).

These cacti are famous for their outstanding flower displays ranging from white to pink to red to orange. The flowers open in the evening, are very large, especially

on *Echinopsis candicans* (white, six-inch flower) and *Echinopsis* 'Flying Saucer' (red, six-inch flower) and last until mid-morning.

6. *Berlandiera lyrata* - chocolate flower - located on the Desert Wildflower Trail, Ottosen Entry Garden, Petrified Wood bed, and Steele Herb Garden.

Flowers are yellow, daisy-like, and smell like chocolate, making everyone's mouth water upon inhaling the fragrance. Flowers open sometime after midnight and close mid-to-late morning. Flowers are attractive to butterflies; seeds are relished by Abert's Towhee.

7. *Calylophus hartwegii* v. *fendleri* - sundrops - located in the Steele Herb Garden and on the Desert Wildflower Trail.

Bright yellow flowers open in the evening, withering by the following afternoon. The blooms attract Sphinx moths.

8. *Oenothera caespitosa* - tufted evening primrose - located in the Steele Herb Garden and on the Desert Wildflower Trail.

Three-inch wide, white flowers open in the evening on top of a green mound of foliage, turning pinkish and withering by mid-morning the next day. The flowers have a very delicate fragrance.

9. *Passiflora foetida* - passion vine - located in the Steele Herb Garden and on the Desert Wildflower Trail.

Pink, lavender, and white flowers grace this native Arizona vine. Flowers have a frilly look and are the host plant for the Gulf Fritillary butterfly. Fruit is edible.

10. *Datura wrightii* - sacred datura - located on the Desert Wildflower Trail.

Flowers are white, trumpet shaped, and five-inches wide. One can actually watch the flowers puff open. The perfume from the flowers is intoxicating. All parts of the plant are poisonous.

Adding one or more of these species to your garden may bring you some fragrant pleasure on the hot summer nights of the desert country.



Garden Connects to Light Rail

This spring, the Garden piloted a complimentary shuttle service connecting our visitors to the Valley Metro Light Rail system. Funded by a generous grant from APS, the shuttle service ran ten hours a day, seven days a week, for the months of February through May. Stopping right next to the Priest/Washington Light Rail station and the Garden's Schilling Entry Arbor, the shuttle provided our guests easy access to the Garden during the *Chihuly: The Nature of Glass* exhibition.

Additionally, the Garden partnered with students from Arizona State University's W.P. Carey School of Business to design and implement an evaluation tool on the shuttle service and its impact on the community. With increasing environmental concerns and interest in alternative methods of transportation, APS and the Garden are excited about having provided this pilot program to our visitors, and are currently evaluating continued usage after this successful trial run.



A New Intersection for the Garden

This summer, most likely during the months of July and August, the City of Phoenix will construct a new roundabout intersection at the Garden's entrance on Galvin Parkway. During construction, the driving route to the Garden's parking lot may change periodically, so all members are encouraged to consult the Garden's web site for updates during the summer months.

Photo Credits:

Page 2	Ken Schutz - Adam Rodriguez
Page 3	<i>Echinopsis vatteri</i> - Adam Rodriguez
Page 4	Left & center photo - Lower Grand Canyon Mohave thistle, Right photo - Ryberg's thistle - Wendy Hodgson
Page 5	(Fig. 1) <i>Hesperoyucca newberryi</i> - Wendy Hodgson
Page 6	(Fig. 2) Ryberg's thistle - Denise Buchanan, (Fig. 3) Ryberg's thistle - Wendy Hodgson, (Fig. 4) Lower Grand Canyon Mohave thistle - Wendy Hodgson
Pages 7	Berlin Agave-Yucca Forest rendering - e group
Page 8	DLS student pruning tree - Adam Rodriguez
Page 9 & 10	DLS students - Rebecca Senior
Page 11	Habitat for Humanity - Barbara Bird
Page 12	<i>Fouquierias macdougallii</i> - George Hall
Page 13	<i>f. splendens</i> and <i>f. macdougallii</i> - Kirti Mathura, <i>f. giguettii</i> - Judy Milke, <i>f. fasciculata</i> and <i>f. purpusii</i> - Greg Starr
Page 16	APS Shuttle van - John Sallot
Page 16	METRO Light Rail - ValleyMetro.org
Page 16	Garden entry sign - Adam Rodriguez
Page 17	Award photos - Adam Rodriguez
Page 17	Teen Rafting Adventure - Courtesy of Desert Botanical Garden
Page 19	Boojum Tree - Adam Rodriguez
Back Cover	Garden Flashlight Tours - Adam Rodriguez



DBG is Award-Winning!

Last fall, the **Sybil B. Harrington Cactus and Succulent Galleries** received the prestigious Valley Forward Environmental Excellence Crescordia Award for Site Development and Landscape-Public Assembly. The Galleries were also recognized with a Merit Award from the American Association of Landscape Architects, Maryland & Potomac Chapters.

The **Marshall Butterfly Pavilion** was voted "Best Place to See Butterflies" by *New Times*, and *Arizona Woman* magazine voted the Garden "Best Valley Attraction to take Out of Town Clients".

Curator of Shrubs, **Kirti Mathura**, received the Herb Society of America's highest annual award, The Helen de Conway Little Medal of Honor for her work in the new Steele Herb Garden. Congratulations! Stop in, and see how beautifully everything is growing.



Prepare for a Rafting Adventure

Immerse yourself in nature on this exciting, all-inclusive trip down the **San Juan River**. In this partnership between Grand Canyon Youth and the Desert Botanical Garden, teens will develop leadership and teamwork skills while learning about the dynamic Colorado River ecosystem.

Spend five days and four nights in a remote wilderness setting with river guides and Garden educators. Hike to impressive archeological sites to see ruins and rock art. Learn about the plants, animals, and people of this river ecosystem. Present a 10 - 15 minute lesson to your peers about a river-related topic of your choice. Call Linda Hairston at 480-481-8146 to reserve your adventure today.

River Trip / July 9-13 / Thursday - Monday

Pre-trip meeting / June 10 / Wednesday / 7 p.m.

Post-trip pizza party/ July 16 / Thursday / 6 p.m.

Member: \$450 / Non-Member: \$500

Price includes transportation, supplies, and meals. Limited to 23 teens, ages 12-15.



Tending the Garden
CAMPAIGN TO ENDOW THE FUTURE

ANNUAL REPORT and Campaign Report Now Available

The Desert Botanical Garden's 2008 Annual Report is being produced as a separate publication this year, rather than appearing within *The Sonoran Quarterly*. The publication celebrates the successful completion of the *Tending the Garden* Campaign and recognizes the Honor Roll of Campaign supporters.

The campaign raised more than \$17.8 million for the Garden's endowment fund and program initiatives in exhibits, education, and research. The report is available on line at dbg.org. If you would like to receive a printed copy, please contact Danielle Vannatter at 480-481-8160 or email dvannatter@dbg.org.

in appreciation

The Desert Botanical Garden is grateful to all 24,243 members and donors for their support. Acknowledged in this section are annual Curator's Circle, Director's Circle, President's Circle and Founder's Circle members and donors giving \$2,500 or more over the year, from April 1, 2008 through March 31, 2009. Included are memberships and unrestricted gifts to support the Garden's annual operations.

\$25,000 +

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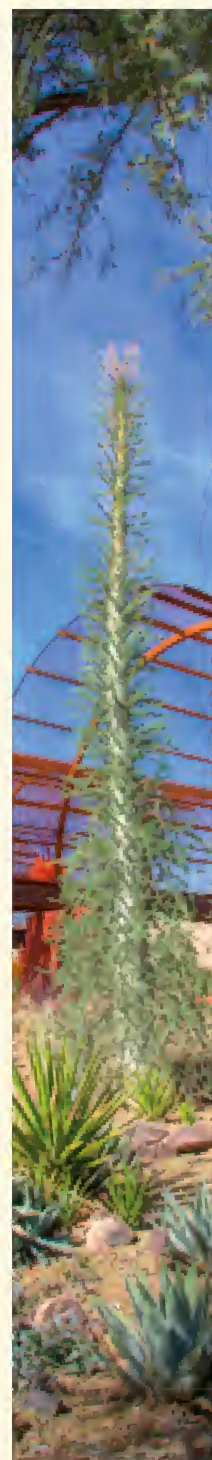
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The Mission Statement of the Desert Botanical Garden

The Garden's commitment to the community is to advance excellence in education, research, exhibition, and conservation of desert plants of the world with emphasis on the Southwestern United States. We will ensure that the Garden is always a compelling attraction that brings to life the many wonders of the desert.

Printed on recycled paper that meets the Forest Stewardship Council's standards for responsible forest management; uses 10% post-consumer waste and printed with soy based inks.

Garden Flashlight Tours

**Thursdays and Saturdays
June 4 - August 29 / 7 - 9 p.m.**

Rediscover the Desert Botanical Garden in the serenity of a warm summer evening during the months of June, July, and August. Tours begin just as the sun is setting and desert creatures and plants begin their evening adventures. Night-blooming flowers open to attract their nocturnal pollinators, and the darkened sky is filled with flying nighthawks, silently soaring owls, and high-flying bats. Strolling along the softly lit trails, experience close encounters with desert creatures and plants at Discovery Stations. Interpreters will introduce visitors to Prince the king snake, Rosy the tarantula, and will share the intriguing relationship between the Palo Verde and the Desert Gardener. You might even be there on that magical, rare evening when the Arizona queen of the night cactus blooms.

Flashlight tours are free for Garden members.

Adults: \$15

Seniors: \$13.50

Students: \$7.50 (13 - 18 & college with ID)

Children: \$5 (3 - 12)

Children under 3 are admitted free

No advance registration required

SONORAN QUARTERLY

FOR MEMBERS AND FRIENDS OF THE DESERT BOTANICAL GARDEN PHOENIX, ARIZONA SEPTEMBER 2009, VOLUME 63, NO. 3



IMPROVING SCIENCE LITERACY will be a high priority in the next strategic plan.



American students are not learning enough science. As reported in the *Washington Post* in 2007, fifteen-year-old American students ranked 17th in science knowledge when compared to students in other countries. In 2008, *The Arizona Republic* reported that sixty percent of all high school seniors in our state failed their first-ever AIMS science test. These are troubling statistics.

The Garden has four key mission areas: conservation, research, exhibition, and education. I think it's fair to say that education is the most important mission of the Garden, for it is foundational for success in each of the other three.

We know that we cannot change the world (at least not overnight), but we also know that we can make a difference when it comes to science education in our community. We already serve 40,000 to 50,000 students with inquiry-based guided tours of the Garden each year, but our goal is to continue to develop new ways of fulfilling our educational mission. We anticipate that our educational impact will soon grow dramatically with the launch of the Garden's new *Digital Learning Curriculum*, coming this fall. A feature article about this new Garden effort, written by Acting Director of Education/School Program and Curriculum Manager, Tina Wilson, is included in this issue. I am sure that you will be inspired when you learn more about this ambitious new undertaking, especially since it will allow the Garden to connect with and support



science teachers throughout the entire state of Arizona.

Improving science literacy among all of Arizona's students will be a high priority in the next strategic plan, which the Garden's board, staff, and volunteers are now busy writing for the years 2012 through 2017. I will share progress with our readers as this new plan takes shape and, as always, I invite you to share with me your ideas, suggestions, and dreams for the Garden's future.

Ken Schutz,
The Dr. William Huizingh Executive Director

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The Sonoran Quarterly

September 2009, Volume 63, No. 3

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In Appreciation

On our Cover

Claret cup, *Echinocereus
triglochidiatus*
Photo by Adam Rodriguez
adamsphoto@cox.net

Back Cover

The Fall Plant Sale is a one-stop
shopping experience featuring arid
plants in one location.

Tending the Garden

DIGITAL LEARNING AT THE GARDEN

dbg.org/digitallearning



Have you ever wondered why a saguaro cactus has ribs, or why so many desert trees have such small leaves? As we encounter new sights or situations, we often find ourselves observing and asking questions about our environment. To find the answers to our questions, we investigate and explore the numerous possibilities.

The method by which we do this is called the *Inquiry Process*. This 8-step process is used and taught throughout the world; it is the basis for scientific research. Students throughout Arizona begin learning the steps of this process starting in kindergarten, and will utilize it throughout their high school and college careers. Thirty percent of the AIMS test for science is dedicated to the Inquiry Process. Question: how can the Garden help teachers and students

with this useful but sometimes intimidating scientific tool? Answer: the *DBG Digital Learning* Web site! This new addition to the Garden's Web site provides teachers and students with the opportunity to explore, investigate, and learn about the desert while employing the Inquiry Process; it's designed to be used in combination with class field trips offered through the Sonoran Desert Adventure Program.

by Tina Wilson, Acting Director of Education/School Program and Curriculum Manager

It is the Garden's goal to have two units, focusing on deserts and the Inquiry Process, available free of charge through its Web site to every student and educator in Arizona.

The curriculum will prepare students for their field trip activities, provide educators with multiple resources for science-based material, and encourage outdoor exploration. It is the Garden's goal to have two units, focusing on deserts and the Inquiry Process, available free of charge through its Web site to every student and educator in Arizona.

Inquiry in the Garden

Inquiry in the Garden moves students through different stages of the Inquiry Process as they learn about the Sonoran Desert. Each stage involves students in the scientific method as they observe, ask questions, make predictions, conduct field investigations, test hypotheses, analyze results, and state conclusions.

Stage 1 – Classroom Introductory Activity introduces students to specific concepts and vocabulary. Students will make observations, leading them to ask questions that may be answered during their field investigations in the next stage of the program.

Stage 2 – Field Investigation involves students in outdoor observations and actual field investigations. The field investigation can be part of a fun and exciting field trip to the Desert Botanical Garden, or carried out as an outdoor schoolyard activity. Students conduct simple investigations and test hypotheses they have proposed.

Stage 3 – Final Classroom Activity leads students through a guided discussion of their field investigation. Students will complete the inquiry process by analyzing the data and drawing conclusions from their investigations.

The last step in the inquiry process is to share one's findings, from which the phrase "publish or perish" comes. To assist students in presenting their work, we have created the *DBG Journal of Student Findings*. This online journal



Digital Desert: Virtual Habitat tutorial.

allows classes to post the results of their experiments either on the blog or to the photo journal. We want students to become excited about what they have accomplished in their classrooms, and to share their experiences with other schools.

Digital Desert

Digital Desert offers online, interactive tutorials that teach each student about deserts in general and the Sonoran Desert in particular. In addition, teachers can use age-appropriate learning activities and discussion questions to further investigate the Sonoran Desert.

- **What is a Desert** (K-8) - teaches students about the three characteristics of a desert.
- **How are Deserts Formed** (4-8 grade) - teaches students how deserts are formed.
- **Virtual Habitat** (K-8) - offers interactive exploration of twenty Sonoran Desert plants and animals, as well as a look at its unique climate.

In order to encourage family participation, students may show their families and friends the work they have published by going directly to the Web

site and entering the Journal, or they can go to the *Digital Desert* where they can explore the Sonoran Desert together.

In addition to *Inquiry in the Garden*, and *Digital Desert*, the site also offers:

Classroom Library: a suggested book list for each grade, with the opportunity to purchase online from the Garden Gift Shop.

Desert Art: lesson plans that incorporate the natural beauty of the Sonoran Desert into fun, hands-on classroom projects.

Desert Glossary: a complete list of terms and vocabulary found in the site.

We are very excited with the vast potential that this medium has for bringing environmental education to the Arizona classroom through technology.

So why does a saguaro have ribs, or desert trees have small leaves? Explore these topics through *DBG Digital Learning* at dbg.org/digitallearning, and experience the thrill of finding the answers for yourself.

The *Digital Learning Curriculum* was created with the support of a generous gift to the *Tending the Garden* Campaign by the Virginia G. Piper Charitable Trust.



WHERE THE DESERT MEETS THE SEA – Research Adventures in Amazing Baja California

Having departed from Phoenix two days earlier, my good friend and research partner, Pete Sundt, and I were nearly 200 miles south of the border in Baja California, Mexico. Our destination in the central part of the peninsula was another half-day drive ahead. At that point, just east of El Rosario, we had not yet entered the realm of the fantastic boojum tree. Knowing we soon would be in their midst, I challenged Pete to a game of spotting the first boojum. Even though I was behind the steering wheel and needed to focus on the road, I had an unfair advantage because I had previously traveled this road many times. I knew where on the surrounding hill slopes the first ones were likely to be; but catching sight of that first one was as thrilling as ever. After a long time away, I was back in the land of the boojum!

My first research trip to Baja California was nearly twenty-five years ago, in February 1985. At that time I was a newcomer to the Sonoran Desert, having been hired by the University of Arizona two years earlier. My assignment there was teaching the second half of every semester in a team-taught biology course. Consequently, for the first two months of each semester I was free to pursue

field research in the Sonoran Desert. Near Tucson, I studied various aspects of the ecology and natural history of paloverdes, bursage, saguaros, and many other plants, as well as their ecological relationships with animals like woodpeckers, pocket mice, and seed-eating beetles. Because I was born and raised in Nebraska, the Sonoran Desert landscape seemed a surreal place with its array of amazing plants

in different shapes and sizes. I was fascinated by them all and certainly the environments near Tucson had plenty to keep me occupied.

Interest born in a botanical garden

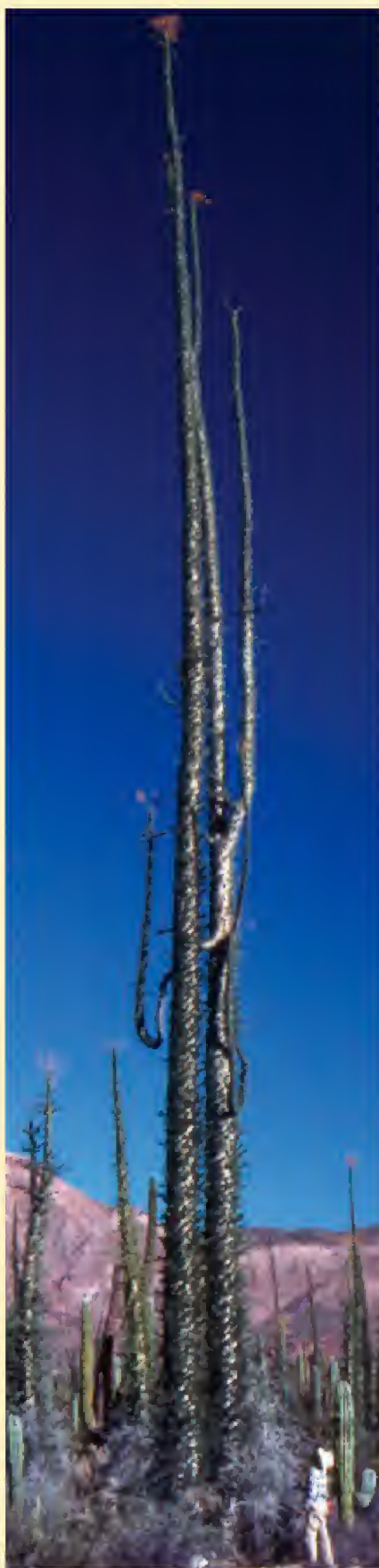
My fascination with Baja California began, in part, with a little botanical garden named the Joseph Wood Krutch Garden on the campus of the

by Dr. Joe McAuliffe, Director of Research

University of Arizona. After teaching, I would frequently eat my lunch on a bench in that garden, surrounded by a half-dozen boojum trees. I marveled at those strange plants and increasingly wanted to observe them in their natural habitat. That experience, combined with reading *A Boojum and Its Home* by Dr. Robert R. Humphrey, led me to seek out the boojum in its home in Baja California.

One of my strongest recollections of my first trip to Baja in 1985 is of how overwhelmed I felt with what seemed like an unending barrage of the extraordinary. What I saw and observed on that trip amounted to a sensory overload. I marveled at all of the strange, new plants—boojums of course, but also forests of giant cardones, elephant trees, and others. As an ecologist, I did my best to interpret what I was seeing and tried to understand the patterns of distribution and abundance of those plants. Although that trip greatly expanded my perspective about the Sonoran Desert, I realized that probably the best way to prepare myself for tackling new research questions in Baja California would be to gain a far better understanding of the simpler, more familiar vegetation in southern Arizona. So, for the next few years I did exactly that, delving more deeply into questions about the factors that influenced plant distributions around Tucson. The approach served me well and left me better equipped to begin asking productive research questions the next time I returned to Baja.

From 1989 to 1993, I made four more research trips to Baja. By that time I had gained knowledge about the geological dynamics of desert landscapes, including the processes by which alluvial fans and soils form. That knowledge was key to understanding why small, relatively young plants were found in some parts of the landscape, but the giant, old individuals were restricted to other parts. Some desert plants, like cardones and boojums can potentially achieve ages of many centuries, whereas individual creosotebush plants can actually persist for thousands of years. Understanding the distributions of extremely long-lived plants required that I expand the



The magnificent, double-trunked boojum, photograph taken January 9, 1990. Dr. McAuliffe is standing to the right of the plant's base.

time frame of my thinking to a more geological time scale rather than the more recent history usually considered by ecologists (McAuliffe, 1991).

An extraordinary giant

Knowledge of where I was most likely to find the oldest, tallest plants eventually led me to an extraordinary specimen. One of my principal study sites is in a long, narrow valley named Valle Montevideo, about fifteen miles inland from Bahía de Los Angeles on the Gulf of California. In 1978, Robert Humphrey published a short paper documenting the tallest boojum tree ever measured, located in the very same valley as my study site (Humphrey, 1978). He measured the slender unbranched plant at 81 feet tall in 1976. My research in that valley involved a considerable amount of reconnaissance on foot in order to understand the distribution of different alluvial deposits and soils on the valley floor. That reconnaissance led me to a giant boojum even taller than the one that Humphrey reported.

The giant was located at the valley's margin, near a steep hillslope. Viewed from the valley floor, the tall plant was camouflaged against the backdrop of vegetation on the hill, and that may be why it had escaped earlier detection. Not until I climbed the slope behind it and gazed out over the valley did I see the top of the giant plant reaching well above the tops of other tall boojums and cardones. This magnificent boojum differed from Humphrey's in that it consisted of a double trunk that was forked at the base. The growing tip of the plant probably was damaged when it was extremely young and two new shoots growing upward in parallel developed into a pair of stately matched trunks, both bearing multiple, twisted side branches.

You may wonder how the height of such a plant is measured. Measurements taken of the angle of a line of sight to the top of the plant from a measured distance from the plant enable the height to be calculated using trigonometry. Based on five measurements I took in January 1990, I calculated the plant's height at 85.24 ft (25.98 m), more than four feet taller than the height Humphrey reported for the

The most magnificent of boojums was gone. I sat there with the old giant's remains until well after sundown, contemplating life and death. I was deeply saddened by the loss, but I felt so fortunate to have had the opportunity to meet the giant when it was still alive...

other plant. I returned to the valley in 1992 and 1993, and both times I paid a visit to that special boojum tree. It had probably been there for many centuries and I assumed it might well be there for at least a couple more.

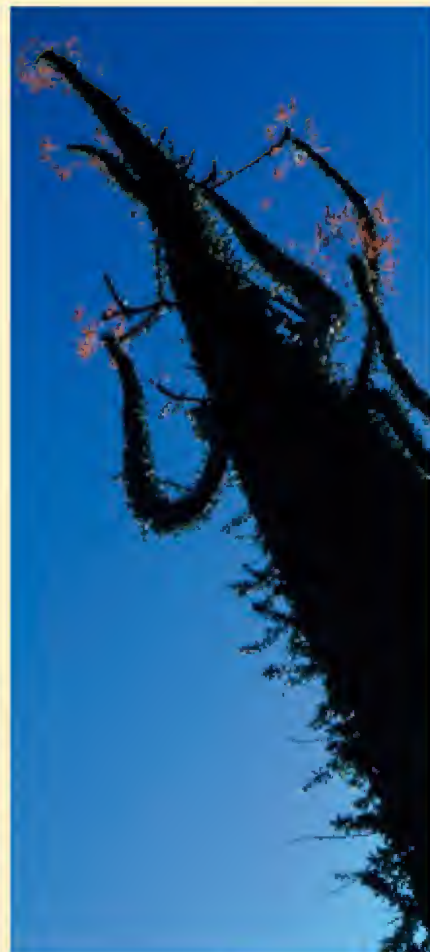
A sad farewell

Sixteen years had passed since my 1993 trip and finally, in March 2009, I was back in Valle Montevideo. My mission was to resurvey study plots I had established in 1990, and of course to pay another visit to the giant boojum. Pete Sundt and I arrived at my old campsite about an hour before sundown. Pete graciously started the preparations for dinner, while I felt compelled to check on the boojum, located about a quarter mile from camp, although I was pretty worn out from the drive.

As I neared the area where I thought it was located, my eyes searched skyward for the giant, but could not find it. Recognizing its camouflaged location, I kept searching but began to wonder if, after sixteen years away, I had mistaken its location. Then, to my shock and dismay, I saw it. The twin trunks, now bleached skeletons, had fallen some time ago and were laid out flat on the ground in different directions. The most magnificent of boojums was gone. I sat there with the old giant's remains until well after sundown, contemplating life and death. I was deeply saddened by the loss, but I felt so fortunate to have had the opportunity to meet the giant when it was still alive, to measure its height, and to have taken a photograph with it in 1990. When I returned to camp, I told Pete, my friend of more than twenty



Pete Sundt and the dead, fallen remains of the giant boojum in March 2009.

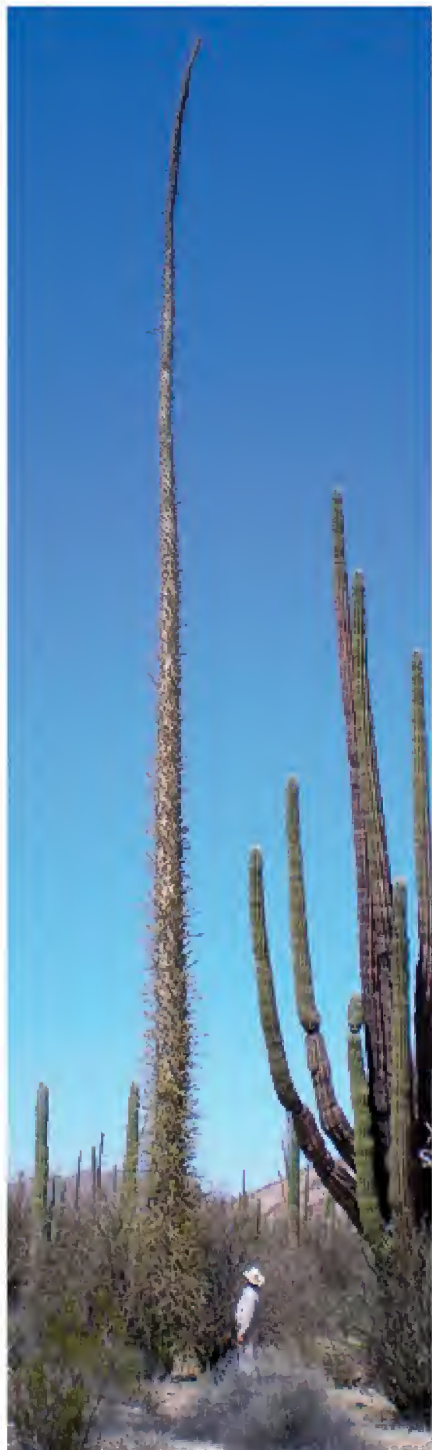


The last time I saw the giant boojum alive. Portrait of upper part of one of the trunks taken in March 1993.

years, of the sad news and also of the poignant lesson the boojum's passing had imparted to me: "Keep up with old friends, because all too soon they will be gone." Pete poured two cups of red wine, lifted his and toasted, "Here's to old friends." Tears came to my eyes.

Pete was sad too, as he had looked forward to seeing the world's tallest boojum. Unfortunately though, flat on the ground, it was now the world's longest boojum. Nevertheless, over the next two days we returned to the remains and spent several hours piecing together the story of why the giant died. Slowly, we gathered the evidence

and clues to determine what probably happened. One of the two trunks had snapped off ten feet above the ground, probably in a strong wind, and was thrown a short distance away from its base. The remaining base probably died as a result, allowing wood-boring beetle larvae to riddle the stump. Eventually that beetle-infested section fell, causing the other remaining, intact



Robert Humphrey's boojum in March 2009.

trunk to fall with it. We measured the lengths of the two fallen stems, which were 80.88 ft and 84.16 ft (24.65 m and 25.65 m, respectively). The taller of the two clearly exceeded the height of the one that Humphrey reported earlier.

Using Humphrey's published photograph, we found the tall plant that he had measured in 1976 and re-measured its height. The average of our measurements yielded a height of 74.22 ft (22.62 m), which is considerably less than the 81 ft height that Humphrey reported. The discrepancy between his and our measurements is probably because the tall stem leans appreciably to one side: measurements taken on the side to which the stem leans yield erroneously tall values, while those taken on the opposite side yield erroneously short values. We avoided this problem by taking our measurements on a side of the plant perpendicular to the axis of leaning. A comparison of the plant's current appearance to its appearance in Humphrey's photograph, taken 33 years earlier, showed no appreciable change. The plant had grown very little, if any, during a third of a century. Such a small rate of growth indicates the plant is certainly very, very old, as was the even taller, twin-trunked giant before it met its demise.

Long-lived wolfberry clones

Our work in Valle Montevideo completed, we departed the central part of the valley for a destination several miles northwest near Agua de Higuera. In that vicinity in 1993, I encountered a few large, ring-like clusters of wolfberry (*Lycium californicum*) with growth forms much like the long-lived creosotebush rings in other parts of the Sonoran and Mojave deserts (see *Sonoran Quarterly*, Dec. 2006; McAuliffe et al. 2007). Using Internet tools (Google Earth) that were not available in 1993, I had examined high-resolution aerial views of the area and found many more of these large ring-like growth forms. With a hard-copy photo mosaic of this area and exact geographic coordinates of individual rings, we were able to quickly find any particular plant we wished to examine. Individual wolfberry rings are probably long-lived clones that grow outward in the same way as do creosotebush clonal rings. However, long-lived wolfberry clones had not previously been reported, so our mission was to carefully examine them and to compare and contrast them with creosotebush clones.

The wolfberry clones were comparable in size and shape to the large creosotebush clones I've studied in the Mojave Desert, with some



One of the many-ringd woldberry clones near Agua de Higuera.

more than 33 ft (10 m) in diameter. We documented many features of the wolfberry clones, including changes that occur as a function of clone diameter, how the central open areas develop, and soil conditions in which clones are found. Although certainly not as charismatic as giant boojum trees, those wolfberry clones, like large creosotebush clones, are undoubtedly much older, probably by at least several thousand years (McAuliffe et al. 2007).

Where the desert meets the sea

The last destination of our trip was Bahía de Los Angeles, one of the most beautiful bays on the Gulf of California, where I have other study areas. This coastal region is very dry, receiving an average of only 2.75 inches of rain a year. The vegetation is very different from that which occurs inland, consisting largely of fleshy-stemmed limberbushes (*Jatropha cuneata*, *J. cinerea*), tree ocotillos or palo adán (*Fouquieria diguetii*), copal trees (*Bursera hindsiana*, *B. microphylla*), and elephant trees (*Pachycormus discolor*), as well as the ubiquitous creosotebush. In returning to that site, I was able to collect additional information on some of the plant-soil relationships that I first started to investigate in 1992. In that very dry climate almost imperceptible differences

in soil texture have very large influences on infiltration of water into the soil and the vegetation that occurs as a result.

A long-term relationship

Although my work in Baja California now spans almost a quarter century, that duration is just an extension of the Desert Botanical Garden's much longer association with Baja's fascinating environments and unusual plants. The magnificent giant cardones and the creeping devil cacti next to Webster Auditorium were collected from Baja California by the Garden's first director, George Lindsay, in 1939, the year the Desert Botanical Garden was established. Those plants and others, like the boojum trees along our trails, have introduced many people to the wonders of Baja California's amazing plant world. Current and future research on the plants of Baja California will provide people with a better understanding of what is one of the most unusual and fascinating parts of the Sonoran Desert.

References

- Humphrey, R. R. 1978. A taller – the tallest? – cirio. *Cactus and Succulent Journal (U.S.)* 50:73.
 McAuliffe, J.R. 1991. Demographic shifts and plant succession along a late Holocene soil chronosequence in the Sonoran Desert of Baja California. *Journal of Arid Environments* 20:165-178.
 McAuliffe, J.R., E.P. Hamerlynck & M.C. Eppes. 2007. Landscape dynamics fostering the development and persistence of long-lived creosotebush (*Larrea tridentata*) clones in the Mojave Desert. *Journal of Arid Environments* 69:96-126.



The Best of Baja – Travel with Lindblad Expeditions and the Garden, April 3-10, 2010

Experience the natural wonders of this amazing peninsula and the Sea of Cortez, whether whale-watching from the deck of the expedition ship or exploring miles of uninhabited beaches and scenic desert. This unique journey is designed with no set itinerary, adding flexibility and a stimulating sense of adventure to each day.

Featured visits to:

- Isla Angel de la Guarda to hike among elephant trees and magnificent cardón cacti.
- Isla Santa Catalina where you will search for marine life and hike among giant barrel cacti.
- Isla Rasa to witness thousands of nesting Heermann's gulls and terns.
- Isla San Pedro Martir, a small island home to thousands of seabirds including blue-footed boobies, red-billed tropicbirds, pelicans, and frigatebirds.
- Isla Carmen to explore via kayak, walks, and snorkel.

Log on to dbg.org/trips to view complete trip information or contact Eric Garton, offsite public programs manager at 480-481-8164 or egarton@dbg.org to learn more.



Jennifer Johnson, Jacob McAuliffe, and Matthew King (left to right) standing within King Clone in the Mojave Desert, California.

Speaking of large, old plants...

In April 2009, Dr. McAuliffe, research staff members Jennifer Johnson and Matthew King, and Dr. McAuliffe's son, Jacob, made a special pilgrimage to visit King Clone, a giant, ring-shaped creosotebush clone located in the Mojave Desert of California. The oval-shaped clone is 75 ft (22.8 m) in length and 47 ft (13.4 m) wide. Dr. McAuliffe has studied the ecology and natural history of creosotebush clones in this area since 1994.

WELCOME NEW GARDEN TRUSTEES

Following an exhilarating year with the Chihuly exhibition, the Trustees will continue planning to reach excellence in every aspect of the Garden's operation and to assure the Garden's long-term viability, with our Mission always guiding the way. We welcome seven new trustees; five were elected for their initial three-year term and two were elected for their second three-year term. Their talents and enthusiasm will contribute to our success. – Lee Baumann Cohn, President Board of Trustees



Rebecca Alles-Fine, a community volunteer, who has been very active in the community since moving to the Valley with her husband Peter. She has served on the Garden's Executive Committee and the Dinner on the Desert Committee in 2009, 2005 and 2004. In addition she is a member of the Board of Fresh Start, a member of the Board of Florence Crittenton and Chrysalis where she started Chrysalis Honors the Family in 2006.



John D. Burnside, an attorney with the international law firm Bryan Cave LLP and a member of the firm's environmental law practice. He is a member of the State Bar of Arizona and the chair of the Maricopa County Bar Association's environmental law section. Mr. Burnside is a Patrons Circle member and member of the Garden's Research, Collections, and Horticulture Committee.



Barbara Hoffnagle, Salt River Project (SRP), she oversees enterprise-wide information technology and major operations support functions. Her career with SRP has spanned a wide cross section of business functions and disciplines, including operations support and financial planning. She is serving on the board of the Fresh Start Women's Foundation, including two years as board chair.



Dr. Mari Koerner, Professor and Dean of the College of Teacher Education and Leadership at Arizona State University's West Campus. Dr. Koerner is also a Member of the Board of Examiners for the National Council for the Accreditation of Teacher Education (NCATE) and serves as vice Chair, Board of Directors, AZ K-12 Center for Professional Development.



Bob Tancer, Professor Emeritus, he taught graduate and executive level courses at Thunderbird, The American Graduate School of International Management, in intellectual property, legal problems of international business and trade, competitive policy, the World Trade Organization and the pharmaceutical industry. He is a graduate of the University of Michigan Law School and received his LLM from Harvard, concentrating in international and comparative law.



Ken Udenze, a partner at Deloitte & Touche LLP serving companies in a variety of industries, including real estate, transportation, life sciences and manufacturing. He is a member of the American Institute of Certified Public Accountants and the Arizona Society of Certified Public Accountants.



Steven G. Zylstra, President and CEO of the Arizona Technology Council. He is a member of the Council on Competitiveness and serves on the board of directors of Tempe, Arizona-based Scientific Monitoring, Inc., a member of the Industrial Advisory Committee at the University of Arizona College of Engineering and Mines, and member of the Arizona Bioscience Roadmap Steering Committee.



NATIONAL GEOGRAPHIC *LIVE!*



THERE'S AN ADVENTURER IN EACH OF US

Even though I grew up in an urban environment, I was lucky to have a park—and even a natural woodland area—near my house. I could spend an entire afternoon exploring nature, finding crayfish under the rocks in a small stream, catching insects in the dead leaves, or just watching the clouds as they shape-shifted throughout the day. The world of nature fueled my imagination.

On rainy days, or in the winter, I explored nature in other ways. One

source was the black-and-white television show *Wild Kingdom* with Marlin Perkins (readers over 50 will remember who I'm talking about!), which I watched every chance I could get. My other outlets for exploration were the stacks upon stacks of *National Geographic* magazines that family and friends heaped upon me. They knew I loved the photographs and stories about nature and far-away places that I thought I'd never see.

As an adult, I have been fortunate to

travel to many of the places that I first read about in *National Geographic*, and the spirit of adventure and wonder developed as a child has guided and enriched my experiences.

How happy I was, then, to reconnect with the National Geographic Society in 2007 when I attended a *National Geographic Live* presentation at the Mesa Arts Center by husband-and-wife filmmakers and naturalists Derek and Beverly Joubert, who shared the experiences

by Ken Schutz, Executive Director

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Community Partner



This year, the Garden was given the opportunity to serve as a community partner in hosting the third season of *National Geographic Live* at the Mesa Arts Center—a relationship that we embrace with great enthusiasm.

they encountered while studying a pride of lions who hunt in water in Botswana's Okavango Delta. The Jouberts were featured presenters in *National Geographic Live Arizona*, a touring speaker series. I loved hearing them speak about their research and seeing the unedited film clips from their expedition.

In 2008, the series returned to Mesa Arts Center, and I was able to hear a presentation by population geneticist Spencer Wells. Wells is the Director of

The Genographic Project at *National Geographic*, which uses cutting-edge genetic and computational technologies to analyze historical patterns in DNA from participants around the world, to better understand our human genetic roots and how we came to populate the planet. I was touched by the story of human unity that his research reveals.

This year, the Garden was given the opportunity to serve as a community partner in hosting the third season of *National Geographic Live* at the Mesa

Arts Center—a relationship that we embrace with great enthusiasm.

The four speakers who will present this season are introduced on page 14.

I encourage all of our readers to consider attending one or more of these remarkably fascinating presentations, where your inner adventurer will be as enthralled and nourished as mine was.

A portion of the proceeds from each ticket sold using the promotional code: DESERT—will be used to support the Garden's mission.

2009/2010 Speaker Series



Wednesday
October 28, 2009
7:30 p.m.

Himalayan Quest

Ed Viesturs
Himalayan Mountaineer

Called “the ultimate climbing machine” by *Men’s Journal*, preeminent alpinist **Ed Viesturs** has summited Mount Everest seven times. Four years ago, he completed an even more ambitious, 16-year quest to climb the 14 highest mountains in the world without supplemental oxygen. Join this legendary mountaineer as he shares his awe-inspiring experiences.

Photo credit: Jake Norton/First Ascent (Viesturs)



Wednesday
December 2, 2009
7:30 p.m.

Polar Obsession

Paul Nicklen
Photographer

National Geographic photographer Paul Nicklen, who grew up on Baffin Island in Canada’s Arctic, takes us underwater and over the ice to witness the stunning wildlife of Antarctica and the Arctic—including leopard seals, whales, walruses, polar bears, penguins, and narwhals. Don’t miss this remarkable evening exploring the wild beauty of the poles.

Photo credit: Paul Nicklen (polar bear), Lyn Hartley (Nicklen portrait)



Wednesday
January 27, 2010
7:30 p.m.

Hunting Dinosaurs

Paul Sereno
Paleontologist

Paul Sereno, often called a modern-day Indiana Jones, leads expeditions to places as diverse as the Sahara and the Tibetan plateau in search of fossils to help chart the evolution of dinosaurs. Travel with Sereno as he shares the thrilling life and recent discoveries of a dinosaur hunter.

Photo credit: Mike Hettwer (Sereno), Mark Thiessen (Sereno portrait)



Wednesday
March 17, 2010
7:30 p.m.

Army Ants and Flying Frogs

Mark Moffett
Ecologist and Photographer

National Geographic photographer **Mark Moffett**’s mission is to find stories that make people fall in love with the unexpected: insects, frogs, and other of nature’s small wonders. This intrepid and eccentric ecologist, whose humor has made him a favorite on late night talk shows, shares the beauty and marvels of life in the treetops.

Photo credit: Mark Moffett (ants), Melissa W. Wells (Moffett with frog)

Support Desert Botanical Garden by purchasing your *National Geographic Live* Arizona tickets using the promotional code: DESERT. A portion of each series subscription and single event ticket will go to fund Garden programs and exhibits.

Single Tickets begin at \$26 / 4-Part Series Subscriptions begin at \$94

Area schools are invited to attend *National Geographic Live* student matinees at the Mesa Arts Center’s Ikeda Theater. Registration opens August 31 at www.nglive.org/arizona

Ticketing information: 480-644-6500
mesaartscenter.com
One East Main Street, Mesa, AZ





Vera Carpenter



Desert Landscape by Vera Carpenter

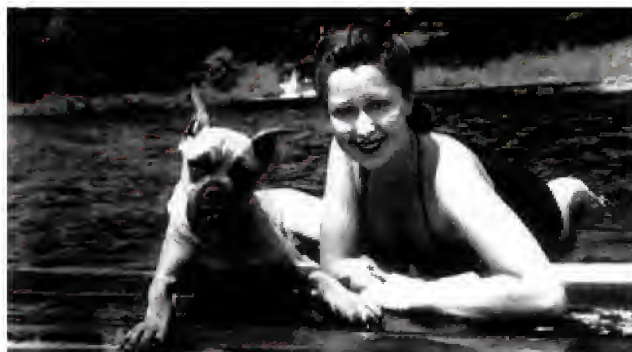
PLANT THE GARDEN'S FUTURE

Vera Carpenter's Legacy for Nature

In the winter of 2007, the Garden learned about a generous bequest from the estate of Vera A. Carpenter. Conversations with a friend, and the examination of mementos saved during her life, reveal Mrs. Carpenter's great affinity for nature. She especially loved the beauty and tranquility of the Sonoran Desert, which contrasted so strikingly with the landscapes she had known during her childhood in Germany, as well as with the more temperate environment of her first home on the east coast of the United States.

Mrs. Carpenter and her husband, Clifford, eventually settled in Phoenix, where they built a home and surrounded it with a garden oasis; she expressed her creative talents by gardening, capturing the desert landscape in watercolors, and nurturing a series of beloved boxer pups. After losing her husband, she pursued a quiet and very private Arizona life. She was a loyal member of the Desert Botanical Garden who visited frequently, bringing friends and family with her to share her curiosity about, and affection for, desert plants. Each visit provided opportunity to learn about native species and to observe the nuances of the desert's seasons.

The Garden became part of Vera Carpenter's life. She wanted the Garden to last, so she thoughtfully made plans for its future. She designated the Desert Botanical Garden, along with The Phoenix Zoo, as a beneficiary of her living trust. As with every bequest, Mrs. Carpenter's gift demonstrates her wish to leave a lasting community legacy. It reflects what was meaningful during her life. Her bequest also affirms her commitment to the Garden's mission and communicates her desire for its continued health and vitality.



Vera Carpenter and Willie, her Boxer

Last year the Garden received a portion of Mrs. Carpenter's gift, which provided funds for purchasing a new four-wheel-drive vehicle for the Garden's scientific research efforts, as well as much-needed work carts for horticulture and facility staff. Mrs. Carpenter's generosity also allowed the Garden to invest in its technology infrastructure, so that the growing number of members and visitors can more easily access Garden workshops, classes, and events such as *Las Noches de las Luminarias*, which was a favorite holiday tradition for her.

The Desert Botanical Garden is grateful for Vera Carpenter's lasting affection for, and commitment to, the Arizona desert and the Garden she loved.

Will your estate plans create a legacy? Sample bequest language is available at dbg.org/Support the Garden/Planned Giving. For assistance, contact Susan Shattuck, gift planning officer at 480-941-3507.

By Susan Shattuck, Gift Planning Officer

AT HOME IN YOUR DESERT GARDEN

Got Milkweed?



Monarch butterfly sipping nectar from *Asclepias curassavica*.

If you don't have a milkweed or two in your garden, consider an addition to your plant palette. Milkweeds of various species are found across the country with a fair share native to the southwest region. Only a few are naturally found in the low desert habitat, but other species from higher elevations can feel at home in our landscapes if afforded a proper microclimate or set of conditions. Depending upon the particular species, a little shade might benefit the plant or an organically enriched soil could be required.

No matter the species or location, milkweeds are celebrated for their support of butterfly populations. Both the Southwest's native queen and the monarch butterflies depend upon them for completion of their life cycles. Flowers of milkweeds, along with an assortment of other plants, provide the adults with nectar. Adult females will lay eggs exclusively on milkweed plants. Once the eggs hatch, the plants provide the necessary food for the caterpillars, or larvae, to develop to the pupal stage (chrysalis) so that metamorphosis into the next generation can be completed. Youngsters will eat various parts of the milkweed plants, from foliage to flower buds, blooms, and developing seedpods. Damage is typically temporary, with new leaves or flower clusters quickly developing to replace those lost to grazing.

Certainly another reason to include some milkweed in

your landscape is the sheer beauty and interest they provide. Forms, flowers, and foliage range from the subtle to the bold, and mature sizes vary from barely a foot tall to four or five feet in height and spread. Some are evergreen, while others disappear underground for the winter season. Milkweed flowers have a unique form that is compatible with their pollinators' actions, which ensures fertilization. Resulting seedpods are ornamental in their interesting shapes, and mature seed glistens when sunlight hits the silky parachute-like attachments.

Among the easiest to grow in your desert garden is native **desert milkweed** (*Asclepias subulata*). It flourishes if given a well-drained soil and full sun exposure. This milkweed is very sculptural in its form. Stiff upright stems emerge from the base and give the plant its overall rounded size of 3 to 5 feet tall and wide. Extremely narrow leaves appear on new growth but last only until the first signs of dryness, dropping to leave the greyish-green stems bare for most of the season. Clusters of yellowish-green to pale creamy-yellow flowers are produced on stem tips from spring through fall. Not only do butterflies visit the blooms, but the intriguing tarantula hawk wasp also frequents desert milkweed to partake of nectar reserves. A similar milkweed species, *A. albicans*, grows a little larger with stouter stems.

by Kirti Mathura, Curator of Shrubs

Just as milk plays a key role in the development of strong girls and boys, milkweed is critical to the development of the young of some of our most spectacular butterflies

Another Arizona native from a slightly higher elevation is **pineleaf milkweed** (*A. linaria*). In our low desert gardens, this species might benefit from a bit of afternoon shade or filtered sun. Well-drained soil is necessary. Pineleaf milkweed has a more shrubby form with short, needlelike, persistent leaves covering upright stems. It will grow in size to 2 feet tall and 2 to 3 feet wide. From spring into the fall season, stems are topped with clusters of small white flowers. This milkweed develops particularly plump seed pods.

Similar in appearance is **narrow-leaf or Arizona milkweed** (*A. angustifolia*). Its leaves are about twice as long as those of the pineleaf milkweed and a bit more loosely spaced along the stems, which tend to branch slightly. It ranges yet a little higher in elevation, also. Narrow-leaf milkweed can benefit from a slightly organic soil and thrives in filtered sun to full sun locations. It blooms prolifically from spring through fall with clusters of pure white or pink-tinged flowers at stem tips.

Bloodflower milkweed (*A. curassavica*) has much bolder flowers and leaves. The leaves are dark green and elliptic in shape. Clusters of golden-yellow, deep orange, and orange-red flowers top the erect stems throughout the warm season. Bloodflower milkweed tends to be semi-deciduous and stems might even die back to the base in a very cold winter, but the plant can easily grow 3 to 4 feet tall and about 2 feet wide in a season. This milkweed prefers a more organic soil. Place it in morning sun and afternoon shade. It needs more frequent watering than the drought-tolerant desert milkweed, but regular top-mulching with compost in the summer will help hold moisture in the soil. There is also a golden-yellow blooming form of bloodflower milkweed.

The **butterflyweed or butterfly milkweed** (*A. tuberosa*) is smaller in stature. It grows to only 1 to 2 feet tall and wide, with short, narrow medium-green leaves. Branching stems develop clusters of bright orange flowers in summer. In the low desert, this milkweed tends to prefer a more organically amended, well-drained soil. Filtered sun or an afternoon shade location is ideal. Butterfly milkweed will die back to a tuberous base in the winter and resprout in the spring.

Other milkweeds might also be grown in your garden. Another **desert milkweed**, (*A. erosa*), develops thick upright stems with large, ovate, grey-green leaves that are sometimes pubescent, and pale greenish-white flowers in the summer. **Antelope horns** (*A. asperula*) has thick, narrow leaves and clusters of white flowers.

Milkweeds generally do not have any threatening pests. However, they are commonly visited by bright orange aphids. These soft-bodied sucking insects do not cause much harm, but their sugary excrement can promote the development of blackish sooty-mildew on plants. It is easy to control populations with a strong jet of water from the hose, or by periodically spraying them with insecticidal soap. You might also notice clusters of bright red young of the milkweed bugs on your plants, and the same controls can be used on them.

Milkweeds produce a milky sap. Although it is not harmful to most people, rinse it off if you get sap on your skin while gardening, just to be safe.

Just as milk plays a key role in the development of strong girls and boys, milkweed is critical to the development of the young of some of our most spectacular butterflies. So make sure your desert garden's got milkweed! **Look for different species featured at the Fall Plant Sale.**



BERLIN AGAVE YUCCA FOREST UPDATE

As this issue of *The Sonoran Quarterly* goes to print, construction has begun in the Berlin Agave Yucca Forest. This new exhibit, made possible by a generous *Tending the Garden* Campaign gift from Howard and Joy Berlin, will showcase the diversity of the agave and nolina families.

Local landscape architect Bob Thompson of e group led the exhibit team through hardscape and planting concepts and design. The 11,000 square foot exhibit, located south of the Sybil B. Harrington Succulent Gallery, will bring dramatic new elements to the Garden. A large *Yucca filifera*, which was salvaged as part of the Succulent Gallery construction a couple of years ago, welcomes visitors into the space as they step off the Desert Discovery Trail and onto Joy's Overlook. A gently sloping walkway traverses the natural wash with views of massed agaves, and leads into the Yucca Forest—an immersion experience among giant yucca specimens.

Plantings throughout the exhibit highlight a variety of agave, yucca, and nolina. More than 1,000 plants will be installed in this exhibit, with over half coming from the Desert Botanical Garden's collection currently in greenhouses. Some of the plants being installed from our collection have never been on display before, such as the *Hesperaloe tenuifolia*. Others, like the *Yucca endlichiana*, have not been on display for at least 10 years. Two *Yucca treculeana*, which were grown from seed by our horticulture department, will also be displayed for the first time in this new exhibit.

We hope to see you in late November for the opening of this spectacular new exhibit.

Faxon's yucca, *Yucca faxoniana*, near Galeana, Nuevo Leon, Mexico.

by Melanie Day, Exhibit Development Manager



Flower of *Yucca filifera*.



Blue nolina, *Nolina nelsoni*.



Whale tongue agave, *Agave ovatifolia*.

Recipients of the 2009 Garden Club of America Awards

Desert Botanical Garden is the administrator of the 2009 GCA Award in Desert Studies, which was generously funded through the GCA by a long-time DBG supporter and Garden Trustee. The annual scholarships were awarded after applications were judged by a panel, with the final recommendations approved by the GCA. The winners are:

Ben Grady is a Ph.D. candidate at the University of Wisconsin-Madison; his proposal outlines an innovative approach for combining new tools in molecular systematics with classic greenhouse experiments. It will investigate the taxonomic distribution of edaphic endemism and lead to a better understanding of soil properties and the ecological variables they produce.

Tobah Gass is a Ph.D. candidate at Colorado State University who proposes to trace the route of carbon compounds produced by certain plants into the soil under three levels of precipitation. She will assess at what level of precipitation in each vegetation type the distribution of soil nutrients becomes more irregular. Knowing this threshold could help determine when semi-arid lands are at risk of permanent conversion to arid lands.

Matthew Bossler is an MLA graduate student at the University of Arizona. His proposal deals with water management and the need to reinvent existing flood structures so that they continue their primary functions, along with increasingly providing recreational habitat and other functions as capacity stabilizes or is reduced over time.



Chihuly update

The popular Desert Towers, which were created by Dale Chihuly especially for the Desert Botanical Garden and installed in the entry agave spiral, have been leased by the Garden through May 31, 2010. **Come by and visit them again!**

Free Admission to the Garden

Beginning in October, admission fees to the Garden will be waived on the second Tuesday of every month, from 1-8 p.m. Admission to the seasonal *Mariposa Monarca* and Spring Butterfly Exhibits will also be waived during these times.

The decision to launch a monthly free admission program came about after the successful Target Free Three-Day Weekend, which was held over President's Day Weekend in 2009. More than 10,000 visitors enjoyed the Garden and *Chihuly: The Nature of Glass*. Many were first-time visitors. After surveying other cultural organizations in the Valley and other Gardens throughout the country, the staff proposed offering monthly free admission. On June 11, 2009, the Garden's Board of Trustees unanimously voted to approve the plan.

"We hope members of our community will visit the Garden and enjoy the beauty of the plants and the Sonoran Desert," said MaryLynn Mack, deputy director of the Garden. "It's about access for everyone."

Curators visit from El Charco de Ingenio

As part of a program to develop relationships with other botanical gardens, DBG was pleased, last April, to host two visitors from El Charco de Ingenio, located in the town of San Miguel de Allende, Mexico.

The two-week stay was a busy one for Martita García and Lorena Gutiérrez. Working with Garden curators, they learned how to care for desert plants, were trained on the use of plant cataloging programs, as well as methods of organizing collections through improved signage. Hands-on work included participation in one of the Desert Landscaper School home installations and learning pruning methodology. Their hosts, Raul Puente, curator of living collections, and his family, saw to it that the trip was not all work: they enjoyed visiting Boyce Thompson Arboretum, as well as the Grand Canyon.

The exchange was made possible through the efforts and generous support of Faye and Jim Kitchel.





The Garden cordially invites you, your family, and friends to attend the 32nd Annual *Las Noches de las Luminarias*, which begins on December 3, 2009. Experience this unique Southwest holiday tradition, as the magic of thousands of hand-lit luminarias cast a soft glow on the Garden's world-renowned plant collection. Follow the sounds of Valley musicians throughout the Garden trails, and make plans to dine in Dorrance Hall with family and friends.

This year, *Las Noches de las Luminarias* has been expanded to include dates between Christmas and New Year's, offering guests twenty nights of entertainment delight. Honor someone special or remember a loved one with a personalized luminaria bag. For details, please contact Kirsten Sharp at 480-481-8147.

Member tickets sales begin September 14. Visit dbg.org for additional details.

Dates:

Member Preview
December 3, 4, 5, 6

General Public / December 10, 11, 12, 13, 17, 18, 19, 20, 21, 22, 23, 26, 27, 28, 29, 30

Ticket Prices:

Members: Adults \$20,
Children (3-12) \$10,
Children under 3 admitted free.

General Public: Adults \$25,
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Food and beverages available for an additional charge.

Hours:

5:30-9:30 p.m.

For 25 or more tickets call 480-481-8104. Group discount will apply.

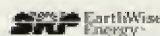
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Connections:

Our colleagues at Phoenix Art Museum are hosting a new exhibit that garden members are sure to enjoy:

A Natural Perspective: An International Juried Exhibition of the American Society of Botanical Artists

The exhibit will run from October 3, 2009 - January 3, 2010 in the museum's Lyon Gallery. The exhibit is scheduled to coincide with the American Society of Botanical Artists (ASBA) annual meeting and conference in Phoenix, and features 40 botanical paintings by 35 different artists. ASBA members from around the world have created works for the show, which capture the often overlooked beauty in the everyday plants around us. Visit PhxArt.org for details.

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The Mission Statement of the Desert Botanical Garden

The Garden's commitment to the community is to advance excellence in education, research, exhibition, and conservation of desert plants of the world with emphasis on the Southwestern United States. We will ensure that the Garden is always a compelling attraction that brings to life the many wonders of the desert.



Fall Plant Sale

October 16 - 18, 2009

Garden Members Preview
Friday, October 16
7 a.m. - 5 p.m.

Open to the Public
Saturday, October 17
7 a.m. - 5 p.m. **AND**
Sunday, October 18
9 a.m. - 5 p.m.

There is no admission charge to enter the Fall Plant Sale

The Desert Botanical Garden Plant Sale is a one-stop shopping experience featuring the largest variety of arid-adapted plants available in one location. Garden volunteers and horticulturists are on hand to answer questions, assist in plant selections, and offer advice. There is also a **used-book sale** offering a wide variety of subjects, with all proceeds benefiting the Garden's library. (Book donations are accepted at Garden Admissions. Please, no magazines.) **Specialty retailers offer pottery and other garden accessories.**



SONORAN QUARTERLY

FOR MEMBERS AND FRIENDS OF THE DESERT BOTANICAL GARDEN PHOENIX, ARIZONA DECEMBER 2009, VOLUME 63, NO. 4





A ROOM WITH A VIEW

My office is attached to Webster Auditorium. In fact, it is located in the only bedroom of what used to be the Garden director's house. I suppose, then, that it is no coincidence that the views looking into the Garden are extraordinary—especially at this time of year.

Just beyond my window are the mighty cardons planted more than seventy years ago. Joined by the creeping devil cacti and an elephant tree that also frame my view, they connect me to the Garden's history. Looking well past these plants I can also see the top of Camelback Mountain, reminding me that the Garden exists to serve all the communities that bustle beyond our own boundaries. In the

middle-ground of the view from my office I can see the vaulted roof tops of the new Sybil B. Harrington Cactus and Succulent Galleries. They remind me of what we can accomplish when we all work together to extend the meaning of excellence in landscape architecture and public garden design. And, finally, at this time of year, I can see from my window hundreds of luminaria bags placed along the Garden trails. As I leave each night at dusk, they shimmer and glow softly as the Garden begins to fill with guests. They serve to remind me of all the local traditions that make the Garden—and Phoenix—such a unique and welcoming community.

In this issue of *The Sonoran Quarterly* you will find an article about American Indian artist Allan Houser, written by Heard Museum curator Diana Pardue. I especially like one quote she attributes to the late Mr. Houser:

**“... when I go to the window ...
and I see all that beauty outside,
I feel good about it, and about my
place in it.”**

I know what he meant!

Wishing you and your family the happiest of holidays,

Ken Schutz,

The Dr. William Huizingh Executive Director



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The Sonoran Quarterly

December 2009, Volume 63, No. 4

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In Appreciation

On our Cover

Allan Houser, *Mountain Echoes*,
1986. Bronze, 41" x 25" x 13",
ed. of 8. Photo credit: Al Abrams.
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Back Cover

Get your *Las Noches de las
Luminarias* 2009 tickets now!
Photo by Adam Rodriguez



NORTH AMERICA'S SPECTACULAR YUCCA FORESTS

by Dr. Joe McAuliffe, Director of Research

Occupying opposite ends of the environmental spectrum, forests and deserts represent the yin and yang of earth's terrestrial environments.

Despite the great contrast, can one contain the other? I've spent time in many kinds of dense, humid forests, and have yet to find one that contains a piece of desert. On the other hand, within deserts I have experienced magical forests and I want to share a glimpse of those special places with you.

Three deserts, three different forests

Each of North America's three warm deserts – the Mojave, Sonoran, and Chihuahuan – contains one or more distinct species of giant yucca. The Mojave has *Yucca brevifolia*, the Joshua tree. In the Sonoran Desert on the peninsula of Baja California, there is *Yucca valida*, called datilillo, and in the southern Chihuahuan Desert of Mexico, there is *Yucca filifera*, the palma china. Awe-inspiring forests of each of these dominate some landscapes in each of these desert regions.

Left: *Yucca filifera* at dusk, San Luis Potosí, Mexico.
Photos by Dr. Joe McAuliffe unless otherwise noted.

Yucca forests close to home

Joshua trees occur naturally only in California, Nevada, Arizona, and the southwestern-most corner of Utah. Although they are often considered an indicator or signature species of the Mojave Desert, they are not found everywhere in that region. Joshua trees grow in slightly less than one-quarter of the total area of the Mojave Desert. They are absent from the hottest, driest lowlands like Death Valley and other low basins, and typically reach their greatest densities at elevations between 4,000 and 6,000 feet.

Where to see them

Joshua Tree National Park is a popular destination for those seeking to see forests of Joshua trees. However, even grander Joshua tree forests are found in other areas. Perhaps the most extensive Joshua tree forest exists on Cima Dome in the much less-visited Mojave National Preserve, located 85 miles north of Joshua Tree National Park. The area has paved roads; one cuts across the northeastern edge of Cima Dome, so you don't need a special vehicle to visit (www.nps.gov/moja/index.htm). Another, equally expansive and grand Joshua tree forest is even closer to home (if you live in Arizona). It is off the beaten track, located in the northwestern corner of Arizona in Hualapai Valley, 45 miles directly north of

One species or two?

Joshua trees look different in various parts of the Mojave Desert. In the western half of the Joshua tree's range, plants have massive, single trunks with the branches high up on the trunk. In the eastern half of the range, Joshua trees have much shorter main trunks and may actually consist of clusters of multiple trunks. These two forms had been designated as different subspecies or varieties – the first known as *Yucca brevifolia* var. *brevifolia*, and the second as *Y. brevifolia* var. *jaegeriana*. However, based on recent research Dr. Lee Lenz, a botanist at Rancho Santa Ana Botanic Garden in California, designated these two types as distinct species: *Y. brevifolia* in the western Mojave and *Y. jaegeriana* in the east (Lenz, 2007). In addition to the differences in the shapes and branching patterns of the plants, they also have considerable differences in their flowers, which are pollinated by yucca moths. Two different species of these moths are associated with the two newly recognized Joshua tree species, thus adding further weight to the new designation.

Heading south to Baja: yuccas on a windswept coastal plain

Yucca valida is the Sonoran Desert's largest yucca, found only in Baja California. It has a wide geographic distribution throughout the peninsula, but is generally found in sandy soils of valleys and plains and is absent from upland, rocky terrains. The plants differ from Joshua trees in the shapes and sizes of leaves, flowers, and fruits, and also the branching habit. Although *Y. valida* can grow to large, tree-like proportions, some of the most unusual forests of this species consist of smaller, scraggly looking plants growing on the sandy coastal plains in the vicinity of Guerrero Negro, located near the peninsula's western boot heel



Yucca forest at Cima Dome, Mojave National Preserve, California. Clark Mountains in the background.

Kingman. This relatively remote location boasts a Joshua tree forest even more extensive than the more familiar one along U.S. Highway 93 (the Joshua Forest Parkway) between Wickenburg and Wikieup. The Hualapai Valley Joshua tree forest is located on a mix of federal (Bureau of Land Management) and private lands, and access to the area is by a well-graded gravel road (see www.americansouthwest.net/arizona/pearce_ferry/index.html for travel directions).



that juts out into the Pacific Ocean. Giant tree-sized yuccas are absent on those exposed plains but populations of the smaller plants are in some places very dense. The leaning or twisted trunks are evidence of the plants' long exposure to unobstructed strong winds and the occasional hurricanes that make landfall in Baja California.

Giant tree yuccas of the Chihuahuan Desert

I've saved the biggest and in some ways the most spectacular yucca for the last—the giant *Yucca filifera* of the Chihuahuan Desert. Although the Chihuahuan Desert extends into Texas, New Mexico, and Arizona, this grand yucca does not make it that far north. Instead, it is found only south of the international border. I've made two road trips through the very center of the range of this yucca species and I especially remember camping within a forest of giant *Y. filifera* near the town of Matehuala in the state of San Luis Potosí, Mexico. Some of the yuccas in that forest exceeded 33 feet (10 m) in height. In the mild weather of mid-October, I slept outside on a cot, gazing at the giant yuccas silhouetted against the dimly lit night sky.

Yucca filifera produces large, pendulous clusters of date-like fruits that hang high from the upper branches. Inside the fleshy pod are many small, relatively hard seeds. Cattle readily eat these fruits, and in doing so, probably pass many seeds unharmed, thereby serving to disperse those seeds. However, most clusters are far out of reach of cattle. Why are such naturally edible fruits held so high, out of the reach of animals that could readily benefit the plant with inadvertent seed dispersal? In the 1980s, ecologist Daniel Janzen and paleontologist Paul Martin considered a variety of plants like this in North America. They concluded that these kinds of fruits were probably eaten long ago by now extinct giant herbivorous mammals – mammoths, mastodons, camels, and giant ground sloths. They furthermore proposed that the peculiar manner in which the fruits of some plants are presented represents an evolutionary response to the feeding habits



Yucca valida on the windswept Vizcaino Plain near Guerrero Negro, Baja California, Mexico.



Hanging fruit clusters of *Yucca filifera* near Matehuala, San Luis Potosí, Mexico.



Living wall of *Yucca filifera*, originating from transplanted stems, San Luis Potosí, Mexico. Photo by Francisco Sanchez Barra.

of those large animals (Janzen, 1986; Janzen & Martin, 1982). All of these large mammals, collectively called the Pleistocene megafauna, suddenly went extinct about 11,000 years ago, but the plants have managed to hold on, despite the lack of what formerly were probably their most efficient seed dispersers. Gazing up at large, pendulous clusters of fruit high overhead at my campsite, I easily imagined giant mammoths grasping whole clusters of fruits with their trunks, ripping the clusters from

the plants, and passing the entire take into their mouths. What a thrill it would have been to have camped in a yucca forest like this 12,000 years ago when the mammoths still roamed!

References

- Janzen, D.H. 1986. Chihuahuan Desert nopaleras: defaunated big mammal vegetation. *Annual Review of Ecology and Systematics* 17:595-636.
- Janzen, D.H. and P.S. Martin, 1982. Neotropical anachronisms: the fruits the gomphotheres ate. *Science* 215:19-27.
- Lenz, L.W. 2007. Reassessment of *Yucca brevifolia* and recognition of *Y. jeageriana* as a distinct species. *Aliso* 24:97-104.



Grand solitary *Yucca filifera* in San Luis Potosí, Mexico. Photo by Francisco Sanchez-Barra.

Walking To School through a Giant Yucca Forest

by Raul Puente, Curator of Living Collections and Research Botanist

While attending college in the city of San Luis Potosí, Mexico, I lived in a small town located only a mile and a half from the college. One of my fondest memories is of walking through a half-mile wide forest of palma china (*Yucca filifera*) on my way to school. The majority of the plants were between 6 and 25 feet tall. The yuccas were typically spaced 15 to 20 feet apart but often there

were patches where they were much closer to one another. I remember asking myself, "How many palmas chinas are in this forest?" My best guess was that there were more than 2,000 large, tree-like specimens and many more smaller, younger ones. I never took the time to count them; I simply enjoyed the experience of walking among these giants.

Much of the surrounding area had been cleared for agriculture, but this particular yucca forest had been spared, perhaps because of the difficulty of removing such a large number of huge plants. Perhaps some people also respected the magnificent plants and decided to preserve them. This forest is one of the few remaining patches of *Yucca filifera* in the highly disturbed valley of San Luis Potosí.

In the middle of the yucca forest was a gigantic specimen more than 30 feet tall, with a trunk greater than 10 feet across at the base. The plant was growing by itself, surrounded by a turf of blue grama grass (*Bouteloua gracilis*). The next nearest yuccas were at least 60 to 90 feet away. Since this giant was in the middle of the forest, it was not visible from outside the forest. It came into view only after reaching the central grass-covered clearing—and what a dramatic sight to behold! The plant's large, buttressed base provided a comfortable place to sit in the shade. Every time I walked through the forest, I stopped to sit beneath this towering plant and marveled at its gigantic proportions. When I took friends on walks, I would always take time to visit this special place as a grand finale for the hike. It was fun to watch and listen to their expressions of amazement and awe when they beheld the magnificent plant.

Berlin Agave Yucca Forest Opens to Public

by Elaine McGinn, Director of Planning and Exhibits

On your next visit to the Garden, we invite you to experience our new permanent exhibit, the *Berlin Agave Yucca Forest*. Made possible by a generous donation from Howard and Joy Berlin through the *Tending the Garden* Campaign, this exciting exhibit showcases some of the Garden's most prized agave and yucca collections.

During my tenure at the Desert Botanical Garden, the little patch of land just outside of the *Plants and People of the Sonoran Desert Loop Trail* was woefully bare, but full of potential. Five years ago the Garden's exhibit team developed a vision for the space that would highlight the agave and yucca plants that are intricately connected to the Garden's history. Last winter, we hired a Phoenix-based design firm, e group, to help make this vision a reality.

While we all contributed to the vision, the end result was unexpected. Who could have imagined a bridge leading into a yucca forest? Or boulders the size of a small car placed in the existing wash? These elements work seamlessly into the fabric of the Garden. And the Joshua trees salvaged from a road project in northern Arizona are the crown jewels of this spectacular new exhibit. We think you will agree that this new exhibit meets the Garden's mission of excellence in horticulture, education, research, and exhibition.

The exhibit opens November 21, 2009.

ALLAN HOUSER



Allan Houser at entrance to the Sculpture Gardens at his studio compound in Santa Fe, NM, 1991, with Buffalo (Cut-Out) - Unique Steel, 17" x 46" x 1". Photograph by Lee Marmon.

Allan Houser is one of the most revered, 20th century American Indian artists. Called the patriarch of American Indian sculptors, he was accomplished as a painter and muralist before beginning his sculpting career. Houser was a prolific artist who worked as a teacher for more than thirty years before devoting full time to sculpting. His lifetime achievements were amazing. He was awarded a Guggenheim Fellowship in 1949, when he was 35, and was awarded the Ordre des Palmes Académique by the French government in 1954. His creativity was endless and his impact on American sculpture and generations of American Indian sculptors remains unsurpassed.

Houser's path to sculpting was an interesting one. In 1940, he studied mural painting with Norwegian muralist Ollie Nordmark in a special program for artists and teachers at the Fort Sill Indian School in

Oklahoma. After seeing Houser's drawings, Nordmark encouraged Houser to try sculpting.² Houser's first attempts at sculpture were small carvings in wood, two of which measure 9 ½ and 10 ½ inches in height and are in the permanent collection of the Gilcrease Museum in Tulsa, Oklahoma. Within a few years, in 1947, Houser entered a sculpture competition developed to honor and commemorate American Indian soldiers. The competition was conducted by the Alumni Association of the Haskell Institute in Lawrence, Kansas. Although he had very little experience in sculpting, no formal training in the medium, and had never created a major work in stone, Houser won the competition and a major commission.

Prior to the competition, he had been working in Los Angeles as a pipe-fitter, a job he took during World War II. Now, with the commission to create

by Diana Pardue, Curator of Collections, Heard Museum

a major work, he embarked on an undertaking that would change his life and make an indelible impact on the field of American Indian sculpture. Because he did not have the funds to take a sculpting class, Houser set aside time before leaving California to observe a sculpture teacher working in marble at the Los Angeles County Art Institute (now the Otis Art Institute). He set out for Oklahoma in the fall of 1948, armed with those observations and his determination to undertake the task.³

When he arrived, he approached the four-and-a-half-ton block of marble with only a few tools, one of which was a jackhammer of the type used to break up concrete. Houser said of this experience, “Before making a scratch, I made full drawings of the figure [in] profile, full face, and back [view]. Next I hung a plumb bob from the ceiling down



Allan Houser, *Comrade in Mourning*, 1948. Carrara marble, 95" x 44" x 44". Photo Courtesy of the Allan Houser Foundation Archives.

In my work, this is what I am striving for – this dignity, this goodness that is in man. I hope I am getting it across. If I am, then I am doing what I have always wanted. — Allan Houser, 1981¹

to the top of the center of where the head would be. I laid the drawings on the stone and took my measurements that way. I struggled. I didn't know that someday I would sail through these things, that these are minor things. But then, it was a tremendous challenge. And I'll never forget it. I was breathless with excitement, wanting to get started, yet cautious. Every now and then I'd pick up a tool and try it out – I was so anxious to see results. I got along pretty well with the big jackhammer, and I found a blacksmith in town who tempered a pointer chisel tool made for the hammer and other hand tools that I adapted to stoneworking. And I started. I put a strong light over the block, and just started roughing it out. There were students coming in all the time to watch."⁴

When the sculpture, *Comrade in Mourning*, was completed, it was the first contemporary monumental work in stone by an American Indian artist and was an indication of Allan Houser's incredible talent and the path ahead of him. The work depicts a solitary figure wrapped in a robe or blanket with an eagle feather headdress and a lance at his feet. For this and many of his sculptures, Houser would draw upon his heritage for inspiration; stories told to him by his father were referenced in his paintings and sculpture.

Following the creation of *Comrade in Mourning*, Houser continued his artistic endeavors, primarily as a painter. In 1949, he won the Grand Award at the Philbrook's Third Annual Competition in Tulsa, for a painting. Next, Houser began a teaching career that would last thirty-four years. From 1951 to 1962, he taught at the Inter-Mountain Indian School at Brigham City, Utah, where he continued to paint and sculpt in his free time, working mostly nights and weekends. From 1952 to 1962, he illustrated seven children's books. In 1962, his life and work would change once more when he accepted a position at the newly formed Institute of American Indian Art in Santa Fe, New Mexico, where he taught painting and sculpture until retiring in 1975.

After working most of his adult life as a teacher, retirement

offered Houser the opportunity to devote his time fully to his artwork. This resulted in a repertoire that included sculpture, drawings, and paintings. He said of his work, “I know when I go to the window of my house, and I see all that beauty outside, I feel very good about it, and about my place in it. And if that comes through in the work, well then, I am pleased.”⁵

In the early 1980s, Houser began to create large-scale sculpture regularly and worked with a foundry to create bronze additions for some sculpture. Most of his sculpture emphasized the beauty of the human form, although Houser created abstract forms as early as 1980 and emphasized abstraction in later sculpture and drawings.

One of Houser's realistic depictions, *Homeward Bound*, 1989, on view at the Desert Botanical Garden, is of a woman herding sheep. Allan Houser revisited this theme throughout his career, from his early watercolors to his acrylic paintings and works of art in bronze. Another image Houser represented in both paintings and sculpture was that of the Apache mountain spirit dancers. In his 1991 creation, *Spirit of the Mountains*, the image is distinctive although the work is stylized with angular shapes and lines. The same is true for *Dialogue*, 1991, in which two figures can be distinguished, although they are tall, narrow forms that appear elongated. Still other works are pure abstraction and can be appreciated for the sharp lines or graceful curvilinear shapes they contain. Houser emphasized shape and form and stated, “I think I can express myself so much better in a simplified way. You know, detail is not the only thing that proves you as a sculptor. Sometimes the lack of detail can prove your abilities even more.”⁶

1 Kyle Lawson, “Sculptor Draws on Heritage in Works of Stone,” *The Phoenix Gazette*. February 25, 1981, NE-3.

2 Jackson Rushing. *Allan Houser: An American Master (Chiricahua Apache, 1914-1994)*, 2004, 74.

3 Barbara H. Perlman, *Allan Houser (Ha-o-zous)*, 1987, 125.

4 Ibid.

5 Lawson, Kyle. “Allan Houser: And the Stones Shall be Silent No More,” *The Phoenix Gazette*. February 19, 1983.

6 Ibid.



Left to right: Allan Houser, *Morning Solitude*, 1989. Bronze 75" x 36" x 48", ed. of 6. Photograph by Peter Vitale. Allan Houser, *Homeward Bound*, 1989. Bronze, 85" x 136" x 24", ed. of 8. Photography by Wendy McEachern. All images on pages 10 and 11. ©Chiinde LLC.

For the first time ever, visitors can see the breadth of renowned American Indian artist Allan Houser's work at two of the Valley's most prestigious destinations: the Desert Botanical Garden and the Heard Museum. The collaborative exhibition, which opens November 21, 2009, is titled *Allan Houser: Tradition to Abstraction*. It highlights the work of one of the best-known and celebrated American Indian artists of the 20th century.

The Desert Botanical Garden's exhibit, which will feature eighteen significant sculptures in bronze, reflects on the modernist influences from which Mr. Houser drew inspiration for his work. The major works, which are on loan from the Allan Houser estate in Santa Fe, New Mexico, are placed along the Garden trails and highlight the evolution of Houser's sculpture from its narrative traditions to his later, more abstract works.

The selected sculptures for the Garden's exhibit highlight Houser's less widely-known contemporary sculptures. Visitors to the exhibit may not immediately recognize the work to be Houser's, but will quickly understand the depth of this creative talent. Works such as *Spirit of the Wind*, *Options*, and the monumental *Cerillos* play against the landscape with strength and grace. Along the *Plants and People of the Sonoran Desert Loop Trail* are the more recognizably Houser pieces *Homeward Bound* and *Warm Springs Apache Man*, for those who seek traditional Houser works.

The Heard Museum's exhibition will feature paintings and sculpture that show the depth and range of works by this talented and honored artist. Many of Houser's early paintings and sculpture depicted themes in Apache life, inspired by stories told by his father. Toward the end of his career, Houser's sculpture became more abstract. The Heard's exhibit will feature an array of early paintings, sketches, and smaller-scale sculpture. Included are watercolor paintings of landscapes, which Houser created in his early artistic years and that have rarely been seen by the public.

The opening of *Allan Houser: Tradition to Abstraction* is planned to coincide with the opening of the Garden's newest permanent exhibit, the *Berlin Agave Yucca Forest*. To highlight the special connection between these two extraordinary exhibits, the sensational *Morning Solitude* will be nestled among the Joshua trees.

***Allan Houser: Tradition to Abstraction* will be on exhibit at the Desert Botanical Garden from November 21, 2009 through May 30, 2010 and at the Heard Museum from November 21, 2009 through August 22, 2010.**

by Elaine McGinn, Director of Planning and Exhibits



Clockwise from left: Allan Houser, *When Friends Meet*, 1987. Bronze, 74" x 68" x 42", ed. of 6. Photograph by Belinda Trujillo. Allan Houser, *Dialogue*, 1991. Bronze, 70" x 30" x 15" x ed. of 6. Photo credit: unknown. Allan Houser, *Options*, 1992. Bronze, 48" x 144" x 48", ed. of 6. Photograph by Peter Vitale.

When Friends Meet

The striking Houser sculpture featured above bears a fitting title for the story of how the joint Desert Botanical Garden and Heard Museum exhibition came together. It's called *When Friends Meet*.

More than two years ago, Howard Berlin, an enthusiastic collector of Allan Houser's work, and Oonagh Boppart, then-President of the Garden's Board, had a friendly discussion about featuring Houser's large sculptures in the Garden. This conversation led to the idea of a joint exhibition, which the friends suggested to Directors Frank Goodyear and Ken Schutz. Each Director embraced the concept and a team from both institutions enthusiastically began planning early this year.

This current collaboration, suggested by generous friends of both institutions, builds upon six decades of collegial institutional relations.

The Desert Botanical Garden and the Heard Museum have each enjoyed being a must-see attraction for Valley

visitors, and for many years have jointly promoted their uniquely southwestern assets.

Bob Bulla, president of the Heard Museum Board of Directors, notes, "Both institutions are world-class attractions, and it's wonderful to see two of our Valley's most spectacular places working together. The culture, the staffs, and the missions are so similarly aligned toward a quality visitor experience. The Houser exhibition is a natural for both attractions, and it's been exciting, as a member of both boards, to bring such an important exhibition to Phoenix." Desert Botanical Garden's president, Lee Baumann Cohn, adds that "both the Garden and the Heard showcase our region's unique, Southwestern cultural assets. Our Board, staff, and volunteers are excited to participate in presenting major pieces from Allan Houser's stunning and significant body of work, and to once again collaborate with our colleagues at the Heard Museum."

by Beverly Duzik, Director of Development

Community supporters have enthusiastically responded to requests to help fund the exhibition; those confirmed are recognized here:

"Chase is delighted to support the Allan Houser project, a creative collaboration of two Arizona treasures—the Heard Museum and the Desert Botanical Garden. Not only will more people enjoy the work of an iconic Native American artist through this landmark effort, they will experience the beauty of two real treasures that Chase has proudly supported for generations."

– Amy E. Flood, Senior Relationship Manager

CHASE

"The work that Desert Botanical Garden and the Heard Museum are doing to bring Mr. Houser's prolific art to the Valley serves as an inspiration to our community. APS applauds this spirit of collaboration, and is proud to serve as an exhibition sponsor."

– Tammy Mcleod, Vice President & Chief Customer Officer

APS

"We are a proud supporter of an exhibition that celebrates Allan Houser, one of the best known and most celebrated American Indian artists. His works capture the spirit of the Southwest in all its diversity, so it is only fitting that the exhibition is presented by two of the Valley's leading institutions."

– Richard Boals, President & CEO

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CASINO ARIZONA

"Our company is committed to supporting the people, cultures, and environment indigenous to Arizona and the Southwest. We are pleased to be a sponsor of the works of Allan Houser, who so accurately captures the distinct spirit of this region."

– Stephen Dow, President, the Embedded Computing business

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“There is always a helping hand and never a dull moment.” This quote best describes the Desert Botanical Garden’s Teen youth program. T.E.E.N. stands for Teen Environmentalist Exploring Nature and this is what we hope to achieve.

Currently there are more than twenty TEEN Pilot Volunteers and over forty Youth Volunteers. The TEEN Pilot program gives teens with a real interest in the outdoors opportunities to volunteer in many aspects of the Garden, receive environmental education training, and attend off-site service learning trips. Youth Volunteers are encouraged to volunteer for our Kids’ Corner craft area and they assist with Garden festivals throughout the year. They receive community service hours for their schools or clubs, along with reaping the benefits of volunteering in a naturally beautiful place.

When asked what the TEEN Program has meant to them, Sydney Galbarski commented, “The whole program has taught us a lot of things, such as teamwork and working with different personalities. It’s been a great experience.” Alexander Schaller added, “I like that we are learning about botany and the environment while having fun.”

In addition to offering volunteer opportunities at festivals, eco-camps, and hands-on work activities, we are also providing off-site service learning opportunities. Our most recent service project has been working with The Nature Conservancy in Wickenburg, Arizona.

It has acquired 33 acres of riparian habitat along the Hassayampa River, which is to be transformed into a community nature park. The TEENs are assisting with this project by taking a survey of the plants in the area and by providing recommendations on the park’s design. They are working on potential Discovery Station ideas, interpretive signs, and hiking and equestrian trails. The TEENs have been working very hard on this project and I know that we will be very proud of their final product.

Calvin Rogers commented, “We had a great time at Hassayampa. There was lots of work to do and it was a new place to explore. It was awesome!”

Nicole Ang added, “I did not know that there were so many different kinds of plants in the desert—all you have to do is look down!”

We encourage more teens to become involved at any time; we have many opportunities and different levels of involvement. Please contact Susan Norton, T.E.E.N. Coordinator at 480-481-2064 or email us at teenvol@dbg.org. Also, take a look at our TEEN blog, dbgteen.blogspot.com, for specific information and pictures.

by Susan Norton, T.E.E.N. Coordinator

A Look at Dinner on the Desert

Twenty-six years ago, the Desert Botanical Garden's Board of Trustees established as its priority the goal of securing donations to develop the *Plants and People of the Sonoran Desert Trail*. It was an ambitious goal, but just how could it be accomplished? Under the leadership of Nancy Swanson, the board began formulating ideas for a fund-raising event. And today, their idea has become one of the Valley's most successful and eagerly awaited evenings—Dinner on the Desert (DOD).

Mrs. Edward A. White and Mrs. George Alpert chaired the first two DOD events. Initiated as a "down-home barbeque with foot-stompin' music," guests celebrated at Chauncey's Arabian Arena. The events were a success and helped generate the donations necessary to build the Garden's *Plants and People of the Sonoran Desert Trail*.

By 1987, momentum for the festive evening event was growing and the Garden's leadership capitalized on its popularity. Themed "An Arabian Night," Chairs Donna Fleischer and Betty Mitchem engaged the horse community with invitations featuring a dramatic Napoleonic horse painting by John Farnsworth. Proceeds were earmarked for the restoration of historic Webster Auditorium, and for the expansion of meeting and event facilities.

Dramatic changes to DOD were evident in 1990 when Mrs. Betty Kitchell served as chair and its venue moved to the Garden. With the help of her husband, Sam Kitchell, daughter Ann Denk, Judy Schubert, and many others, Mrs. Kitchell planned a beautiful evening. "Our challenges included waiting to see if the Garden's new patio would be ready in time for the event and then debating with Robert Breuning on whether or not to spend money to light the butte," comments Mrs. Kitchell. All went according to plan – the weather cooperated and a new

space named Ullman Terrace served as a distinctive event setting.

DOD was well-established as an annual fundraiser by 1993. Guests preferred wearing casual desert duds rather than the customarily worn black ties and formal gowns. In addition, the silent auction portion of DOD's activities featured unique items, giving guests the opportunity to bid on specimen plants and exotic containers. It was clear that the Garden had a winner and that DOD was a hit.

A dedicated volunteer, Faye Kitchel, served as DOD chair in 2006. Faye has helped plan the event by serving on the committee for five years with her primary role setting up the silent auction and securing donated items. When the Garden's leadership approached Faye to chair the event, she agreed but wasn't sure what to

expect since she previously had not chaired an event of this magnitude. Faye commented, "The employees working behind-the-scenes made the entire experience truly memorable. The level of staff commitment at the Garden is extraordinary."

"Perhaps my favorite thing about the Garden is that each of the donors, members and volunteers, believe it is their own—each sharing a personal connection with it—I think that is truly magical," continued Faye.

In the twenty-six years since its first effort, DOD has become a tradition at the Garden. The event's success is attributed to the individuals in the community who generously donate their time, talents, and funds to support the Garden's programs. This commitment continues to make Dinner on the Desert a favorite of many members and guests.



PAST CHAIRS DINNER ON THE DESERT

1994 Sam Campana Scott Jacobson William R. Shover	2002 Tahnia D. McKeever William T. Smith
1995 Jeffrey P. Anderson Edmund G. Zito	2003 Meredeth Moss Joann Petz
1996 Mary Nesset	2004 Sue Melton Rebecca Ailes-Fine
1997 Martha Hunter Stephen H. Roman	2005 Rebecca Ailes-Fine & Peter Fine
1998 Mary K. Sterling	2006 Faye Kitchel
1999 Rosellen Papp	2007 Sue Melton
2000 Craig Pearson Tahnia D. McKeever	2008 Amy E. Flood Scott T. Schaefer
2001 Jacquie Dorrance Craig Pearson Carol Waldrop Linda Whitney	2009 Rebecca Ailes-Fine David Bauer

Linda Whitney, Faye Kitchel, Rebecca Ailes-Fine, Tahnia McKeever, Amy Flood, Sue Melton, Betty Mitchem, Kim Sterling, Meredith Moss, Scott Schaefer. Past DOD Chairs at a reunion luncheon May 18, 2008.

PLEASE SAVE THE DATE

Saturday, April 24, 2010

Chair: Barbara Ottosen

Goal: \$325,000

Individual Tickets: \$500

For more information
contact Esther Battock
at 480-481-8182.

by Beckie Mayberry

AT HOME IN YOUR Incredible Edibles of the Desert DESERT GARDEN

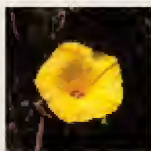
The Sonoran Desert region is an area of rich natural and cultural diversity. It's home to thousands of plant species and nearly forty indigenous groups of people who had intimate knowledge of the plants that provided their spiritual and subsistence needs (Hodgson, 2001).

Nearly 600 plant species were used for food alone, some of which are still used, while many await rediscovery as foods that can help our nutrient-challenged diets and help redefine our relationship with food. The following plants at one time were important in the diets of indigenous peoples. These plants may also play an important role in our future diets if we so desire.



Salvia columbariae - chia; *Harriet K. Maxwell Desert Wildflower Loop Trail*

Everyone knows of the Chia Pet, sprouting seeds of *Salvia hispanica*. More people, though, need to know of chia's edible virtues—the seeds of both species are extremely nutritious. Native peoples knew, having once used them roasted, ground, and mixed with water (sometimes with sugar) to make a meal; or whole, soaked in water, whereupon a gelatinous mass formed, which they drank. Not only does chia drink or meal taste good, it is nutritious as well, providing high protein and oil concentrations, including omega-3 fatty acids—the highest amounts known for any foodstuff—and tasting much better than fish oil.



Merremia aurea - yuca; *Eliot Patio*

This attractive yellow-flowering vine is endemic to southern Baja California. Its large, tuber-like roots are edible and once provided a food source to southern Baja tribes such as the Pericú and Guaicura. The root was cut into pieces that were then roasted. Early Jesuit

padres were often confused as to what these plants were, comparing them to more familiar starchy, tuberous root-bearing plants like manihot (cassava and its relatives) of greater New Spain. Today, these lovely plants do more to fill our senses of beauty than to fill our stomachs.



Cercidium microphyllum
(*Parkinsonia microphylla*) -
foothills paloverde, littleleaf
paloverde; throughout the
Garden, Butte

Both the immature and mature seeds of the foothills paloverde were an important food to southwest peoples, eaten fresh, boiled, or parched and ground. To Baja California tribes, the seeds were especially sought after. A Jesuit padre described how one could not remain in the rancherías because of the noise the natives made, day and night, breaking and grinding the seeds with stones. Immature seeds taste like peas, while the mature seeds can be eaten as nutritious, good-tasting flour. In contrast, the immature seeds of the blue paloverde are bitter and the mature seeds are too hard to eat.

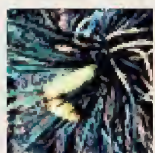


Capsicum annuum* var. *aviculare
- wild chile, bird-pepper, chiltépin;
*Plants and People of the Sonoran
Desert Loop Trail, Steele Herb Garden*

This chile is the most northern variety of the very large *Capsicum annuum* group, which contains many other varieties, the most common one being var. *annuum*. Wild chiltépíns have been used for at least

by Wendy Hodgson, Curator of the Herbarium and Research Botanist

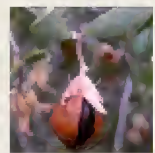
8,000 years (Callen 1965), being most popular in the desert Southwest and northern Mexico. The bright red fruits of chiltépíns add flavor to monotonous diets and are rich sources of vitamins A, C, B-2, niacin, and potassium. They are also used to treat acid indigestion and can be used as a preservative. Most chiltépíns are harvested completely from the wild—and the amount harvested is staggering, measured in tonnage!



***Yucca baccata* - banana yucca; throughout the Garden**

Many southwest tribes ate the pleasant-tasting, sweet and nutritious fruits when fully ripened, from September through October.

Unripe fruit could be gathered and roasted, or allowed to bake in the sun until they were edible. Fruits could be eaten fresh, or more often cooked, then dried for future use and rehydrated when needed. For Western Apache, yucca fruits were once an important regular food, but more recently they consider the fruits as a specialty item (Potter-Basso 1991). Eating too many fruits (I regretted having eaten five once) can cause discomfort as related by the famous ethnobotanist Edward Palmer, who stated that “this fruit proved to be a vigorous cathartic when dry”[and when fresh!].



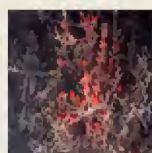
***Simmondsia chinensis* - jojoba, goatnut, deernut; throughout the Garden**
Many consider the large, brown seeds of jojoba to be too bitter in taste, but I find them a welcome, good-tasting snack that is available

for much of the year. People once ate the seeds either fresh, or parched and ground, with the resulting oily meal made into a cake-like food item or used as a coffee substitute. Early Jesuit padres Frs. Kino and del Barco noted how the seeds could be an effective remedy for different illnesses including urinary disorders, flatulence, indigestion, cancer, and “fiery hangovers.” In the wild, plants are normally dioecious (male and female plants) and only female plants produce seeds. However, I have observed nursery stock plants that apparently produce seed with no male plants nearby.



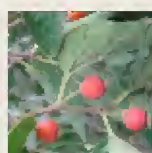
***Portulaca oleracea* - purslane, verdolaga; a summer weed in disturbed areas**

This plant emerges in the summer and is usually looked upon by the uninformed as a useless, uninvited weed. Its tasty, fleshy leaves and young stems provide a good source of vitamin C, beta-carotene (a precursor to vitamin A), omega-3 fatty acids, and anti-oxidants. Plants hold potential as a crop well-adapted to soils characterized by high salinity. Scientists still disagree as to whether or not it is native to the Americas, or if and when it was introduced to the Americas from the Old World. Evidence suggests that purslane was in the New World during pre-Columbian times, perhaps as far back as 2,500 to 3,000 years ago (Chapman et al. 1973). From wherever and whenever it came, purslane is more than just a weed to be eradicated.



***Lycium fremontii* - wolfberry, desert-thorn, tomatillo; Plants and People of the Sonoran Desert Loop Trail**

Most wolfberry species produce edible fruits that played an important role in the diets of southwestern people. They were eaten raw, sun-dried, or cooked in water (with sugar) to make soups, stews, syrup, sauces, or beverages. Berries were dried and stored, then rehydrated when needed. The Tohono O’odham collected and sold 10-pound bags of fruits as recently as the 1980s. This wolfberry species produces numerous large, sweet-tasting fruits and was considered to be a potentially important crop for arid regions, tolerating poor-quality water and soils.



***Celtis laevigata* var. *reticulata* - netleaf hackberry, cumaro, *C. pallida* - desert hackberry, capul; throughout the Garden**

The fruits of both hackberry species are small, fleshy, reddish drupes with large stones. People generally ate the fruits raw or ground them into a meal in the summer and fall. Fruits of *C. pallida* have relatively high percentages of crude protein, phosphorus, and calcium when compared to fruits of other woody plants. I find them very tasty and sweet when gathered at the right stage. Both species are visited by numerous bird species that feed on the many red fruits, dispersing the seeds thereafter. In the wild, both hackberry species are nurse plants to chiltépíns.

Look for additional interesting information on our website, dbg.org, in the future, answering such questions as, “Why are littleleaf paloverde seeds better tasting than those of the blue paloverde? Is there a special area designated for the protection of wild chiltépíns in the United States, and where? What food sources have the potential to lower glycemic levels and promote their slow absorption, thereby decreasing the risk of diabetes?”

References

- Callen, E. 1965. Food habits of some pre-Columbian Indians. *Economic Botany* 19:335-343.
- Chapman, J., R. Stewart and R. Yarnell. 1973. Archaeological evidence for pre-Columbian introduction of *Portulaca oleracea* and *Mollugo verticillata* into Eastern North America. *Economic Botany* 28(4): 411-412.
- Hodgson, W. 2001. *Food Plants of the Sonoran Desert*. University of Arizona Press, Tucson.
- Potter-Basso, G. 1991. *Yucca baccata*: From the beginning. *Arid Lands Newsletter* 31: 24-29.

garden news

Connections:



SEASON FOR SHARING

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This year, when you purchase your tickets for *Las Noches de las Luminarias*, you will have the opportunity to make a donation to Season for Sharing, *The Arizona Republic's* and 12 News' annual holiday fundraising campaign.

Season for Sharing funds agencies that help at-risk children and families, improve education, aid victims of domestic violence, and serve the elderly.

Since its inception in 1993, Season for Sharing has given nearly \$38 million to Arizona communities by funding programs that help those in need. Donations are matched through Gannett Foundation 50 cents on the dollar until the fund reaches \$800,000. *The Arizona Republic* and 12 News cover all administrative and fund-raising costs, so every penny donated, plus the matching dollars, goes directly to the agencies to serve Arizona's most vulnerable residents.

The Garden believes in the mission of Season for Sharing and hopes that when you buy your *Luminaria* tickets, you will add a few dollars to your order. Every donation counts.



Free Admission to the Garden

Admission fees to the Garden are waived on the second Tuesday of every month, from 1-8 p.m.

The decision to launch a monthly free admission program came about after the successful Target Free Three-Day Weekend, which was held over President's Day Weekend in 2009. More than 10,000 visitors enjoyed the Garden and *Chihuly: The Nature of Glass*. Many were first-time visitors. After surveying other cultural organizations in the Valley and other gardens throughout the country, the staff proposed offering monthly free admission. On June 11, 2009, the Garden's Board of Trustees unanimously voted to approve the plan.

"We hope members of our community will visit the Garden and enjoy the beauty of the plants and the Sonoran Desert," said MaryLynn Mack, deputy director of the Garden. "It's about access for everyone."

Get Culture at the Library!



Art that inspires, hands-on science that stimulates the mind, history that brings the region alive, plants and animals from here and around the world – all this and more is waiting for you at twenty Greater Phoenix area public libraries. Just use your library card

to check out a Culture Pass, which is valid for four free admissions to one of thirteen museums, cultural centers, and historical sites. To learn more, visit ShowUp.com/CulturePass, stop by the Garden to pick up a brochure about the program, or visit your local library.

Save the Date! Golfin' in the Desert
May 8, 2010 at ASU Karsten Golf Course

Community Resource Has a New Name: Schilling Library



On September 29, 2009, the Garden and invited guests honored Carol and Randy Schilling at a ceremony in which the Garden Library was renamed the Schilling Library.

Recognizing significant current and planned gifts to the *Tending the Garden* Campaign, Director Ken Schutz paid tribute to these generous Garden friends.

The original Library was built near Webster Auditorium in 1970 to accommodate an outstanding collection contributed by Max Richter. It was called the Richter Memorial Library until 2001. After the move to more spacious quarters in the Nina Mason Pulliam Center for Desert Research and Horticulture, it became known as the Garden Library. The Library holds one of the world's finest special collections of books on the subject of desert plants, including rare books and papers in the temperature-controlled Becker Library Archives. Ongoing contributions from scientists, botanists, and Garden friends continue to enhance the collection. Recognition of Mr. Richter's gift continues today: a framed photograph displayed in a prominent location is accompanied by a description of his original donation.

In naming the Schilling Library, the Garden acknowledges the commitment of two special individuals who have generously contributed their funds, time, and talent. Thank you, Carol and Randy Schilling, for thoughtfully dedicating your gift "to all who seek to know more about the plants of the world."

Photo Credits

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Page 17	Randy and Carol Schilling – Renee Immel
Page 17	Bill Thornton stands in front of a cactus in his yard that he bought at the Garden in the 1950s.
Page 19	<i>Ferocactus pilosus</i> – Adam Rodriguez

Member Profile: DBG's Longest-standing Member

Bill Thornton was just 13-years-old in 1956 when he paid \$5 to become a member of the Desert Botanical Garden. Since then, he has faithfully continued his support throughout the years.

His love of desert plants began when a neighbor gave him a stack of *Saguaroland Bulletins*. His fascination with these Garden newsletters prompted his father to drive him from their home in Tucson to Phoenix to visit the Desert Botanical Garden. Bill and his father became invested in the Garden, and even entered a plant into the Cactus and Succulent Show their very first year as members.

A love of desert plants has been woven throughout Bill's life. After his retirement he became an active member of the Tucson Cactus and Succulent Society, which is devoted to saving cacti from land development. Bill's dedication to preserving the desert has led him to knock on doors to help get the Desert Conservation Plan passed. He also volunteers with the Sonoran Desert Weedwackers manually pulling buffelgrass and other invasive species on roadsides and rugged slopes.

When the Krutch Garden at the University of Arizona was in danger of being demolished, Bill's passion for desert plants guided him to help save it. The Krutch Garden holds some amazing specimens of boojum trees. Thanks to Bill's efforts, it

is still around today.

Bill has seen remarkable growth and evolution at the Garden over the past fifty-three years, and he is amazed by the dedication of the staff and volunteers that sustain it. He feels pride that the Garden is one of the foremost research institutions for desert flora. We are grateful to have Bill as one of the Desert Botanical Garden's loyal members. We are pleased to see the impact the Garden has had on his life as well as the impact Bill Thornton has had on the preservation of the desert.



2010 Chihuly Wall Calendar Now Available

The Garden Shop is proud to offer the 2010 Dale Chihuly wall calendar.

The calendar showcases images from Chihuly's recent exhibitions, including photos from the Desert Botanical Garden's exhibit. The 15-month calendar can be purchased for \$12.95 and would make a great holiday gift for anyone who enjoyed *Chihuly: The Nature of Glass*. To order online go to dbg.org/chihulycalendars.

in appreciation

The Desert Botanical Garden is grateful to all 24,330 members and donors for their support. Acknowledged in this section are annual Curator's Circle, Director's Circle, President's Circle and Founder's Circle members and donors giving \$2,500 or more over the year, including memberships and unrestricted gifts to support the Garden's annual operations as of September 15, 2009.

\$25,000 +

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William Huizingh+
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Linowski at 480-481-8144.*





SONORAN QUARTERLY

1201 N. Galvin Parkway
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The Mission Statement of the Desert Botanical Garden

The Garden's commitment to the community is to advance excellence in education, research, exhibition, and conservation of desert plants of the world with emphasis on the Southwestern United States. We will ensure that the Garden is always a compelling attraction that brings to life the many wonders of the desert.

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